

U.S. Department
of Transportation

United States
Coast Guard



Commanding Officer Rm. 301, P. O. Bldg.
U. S. Coast Guard 601 Rosenberg
Marine Safety Office Galveston, TX
77550-1705
(409) 766-3687

16611
April 25, 1995

Hercules Marine Services Corporation
P. O. Drawer C
Freeport, TX 77541

Dear Sir:

I have received your Letter of Intent to operate a marine transfer facility in the Port of Freeport.

After a review of your Operations Manual the following discrepancies were noted:

Regulation

Comment

33 C.F.R. 154.310(a)(2)

Each Operations Manual must contain a physical description of the facility including a plan of the facility showing mooring areas, transfer locations, control stations, and locations of safety equipment: Facility's site plan does not show mooring areas, transfer locations or safety equipment.

33 C.F.R. 154.310(a)(14)

Each Operations Manual must contain quantity, type, location, instructions for use, and time limits for gaining access to the containment equipment: Operations manual does not have instructions for use of containment equipment.

HER 03298

16611
April 25, 1995

Subj: Hercules Marine Services Corporation Facility Operations
Manual

33 C.F.R 154.310(a)(15)

Each Operations Manual must contain quantity, type, location, and instructions for use of fire extinguishing equipment: Operations Manual does not have instructions for use.

33 C.F.R. 154.310(a)(21)

Each Operations Manual must contain a description of the training and qualification program for persons in charge: Operations manual does not have description of training program.

Please make the above corrections and re-submit your Operations Manual to this office for approval. If you have any further questions, please contact my Facilities Branch Chief, Lieutenant (jg) Merriweather, at (409)766-3687.

Sincerely,



D. W. KUTZ

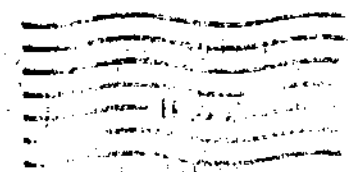
Commander, U. S. Coast Guard
Captain of the Port

HER 03299

DEPARTMENT OF TRANSPORTATION

U.S. COAST GUARD
COMMANDING OFFICER
USCG MARINE SAFETY OFFICE
RM. 301, POST OFFICE BLDG.
601 ROSENBERG
GALVESTON, TX 77550-1706

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, \$300



DOT-514

*↑ Value
date sent*

115



HER 03300



HERCULES

MARINE SERVICES CORPORATION

Strength through environmental awareness and customer service

P.O. Drawer O
Freeport, Texas 77541

Office (409) 233-6371
Fax. (409) 233-6375

HERCULES MARINE SERVICES CORPORATION

L E T T E R O F I N T E N T

UNITED STATES COAST GUARD

FACILITY OPERATIONAL MANUAL

THIS IS A LETTER OF INTENT FOR HERCULES MARINE SERVICES CORPORATION TO HAVE A FACILITY FOR CLEANING AND STRIPPING BARGES IN FREEPORT, TEXAS. WE WILL ALSO BE TAKING SLOP OIL FROM BOATS. THE PHYSICAL LOCATION OF HERCULES MARINE SERVICES CORPORATION IS AT MILE 393 OF THE INTRACOASTAL WATER WAY (I.C.W.W.).

HER 03301

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PURPOSE & OBJECTIVES	A
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HERCULES

MARINE SERVICES CORPORATION

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P.O. Drawer O
Freeport, Texas 77541

Office (409) 233-6371
Fax, (409) 233-6375

PERSON IN CHARGE (CFR 154.710)

Hercules Marine has designated these employees as PERSON IN CHARGE.

CLAUDIO DUARTE

JUAN RIVERA

SAM PETTIT

DANIEL HERNANDEZ

GABRIEL DE LA ROSA

JOE OLIVAREZ

RICHARD RODRIGUEZ

LUCIO NAJERA

TRINO RODRIGUEZ

Each person has had at least 48 hours experience in chemical transfer operation at this facility and understand the following:

1. THE HAZARD OF EACH PRODUCT TO BE TRANSFERRED
2. OPERATING PROCEDURES
3. SPILL REPORT PROCEDURES
4. CONTINGENCY PLAN

HER 03303

U.S. COAST GUARD
FACILITIES AND OPERATIONS MANUAL
SPILL PREVENTION, CONTROL AND COUNTERMEASURE PLAN

HERCULES MARINE SERVICES CORPORATION
FREEPORT, TEXAS

PREPARED BY:

HERCULES MARINE SERVICES CORPORATION
FREEPORT, TEXAS
JANUARY 16, 1995

HER 03304

PURPOSE

The purpose of this Manual is to delineate the procedures to be followed, describe the duties of operating personnel and to indicate the intent of Federal and State laws in the safe and correct operation of the Hercules Marine Division - Freeport facility during cleaning and repair operations. Further, this Manual will describe the procedures to be followed in the event of an emergency or accidental situation which results in the discharge of chemical products to navigable waters.

This document is prepared to (1) comply with United States Coast Guard law and Federal Water Pollution Control, (2) provide evidence of our intent to prevent contamination of our environment by accidental spills and (3) provide basic data on our present spill prevention plans.

This document is prepared for the final configuration and normal operation of the facility.

This Manual should be reviewed and understood by all Hercules personnel involved with cleaning operations. Amendments must be made when structural or operational changes occur at the facility.

OBJECTIVES

To outline a program at the facility for the prevention and control of miscellaneous chemical spills. This plan is carried out immediately whenever there is a spill which could threaten the environment.

This program enables Hercules to be in compliance with the requirements of 40 CFR-112.

SPILL SOURCES

There are approximately sixteen storage tanks that are located within a concrete dike at cleaning area. A diesel tank located on the site is also in a concrete dike.

All tanks are designed in accordance with API code. These tanks are routinely inspected externally and internally (when cleaned) by visual observation. The external surface is frequently checked by operating personnel for signs of leaks which might cause a spill. The tanks are routinely hydrostatically tested for leaks (after cleaning) from seams.

Routine inspection of the transfer hose for leaks is done by hydrostatically pressuring hoses. Each of these hoses are equipped with Kamlok fittings and are manufactured to provide a minimum design burst stress of at least 600 psi and a maximum allowable working pressure of at least 150 psi.

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1

The Hercules Marine Division-Freeport facility is situated on the Intracoastal Waterway at mile marker 393, in the commercial and industrial area near Freeport, Texas, in Brazoria County. The geographical coordinates of the facility are 28 58'05" north latitude and 95 17"26" west longitude. The site is bordered by wetlands to the north. Dow Chemical plants are about 3 miles to the west. Intracoastal Water way borders the facility to the south.

The Hercules Marine Division - Freeport facility is located near the township of Surfside and is governed by the town of Freeport. The yard encompasses approximately 24 acres. The yard is used as a repair and chemical facility for chemical barges.

The Hercules Marine facility is open for operations twenty-four hours per day, 365 days per year.

The Hercules Marine facility is involved with the cleaning and mechanical repairing of barges with chemical product. The barges vary in sizes from 195 X 30 to 295 X 50 feet. Though there may be two or more barges tied up at a time, only one barge is stripped at a time.

Under the supervision of the Yard Superintendent the Foreman on duty will be responsible for all phases of work which would include barge cleaning and repair and compliance with safety procedures. In the event of a chemical spill, this individual must also carry out the prescribed spill containment and cleanup procedures.

The operators and supervisors should be made aware of the causes of hazardous chemical spills and their consequences. Methods for prevention of spills should be stressed and procedures of containment and control should be well understood.

ATTACHMENT 1
FACILITY LOCATION MAP

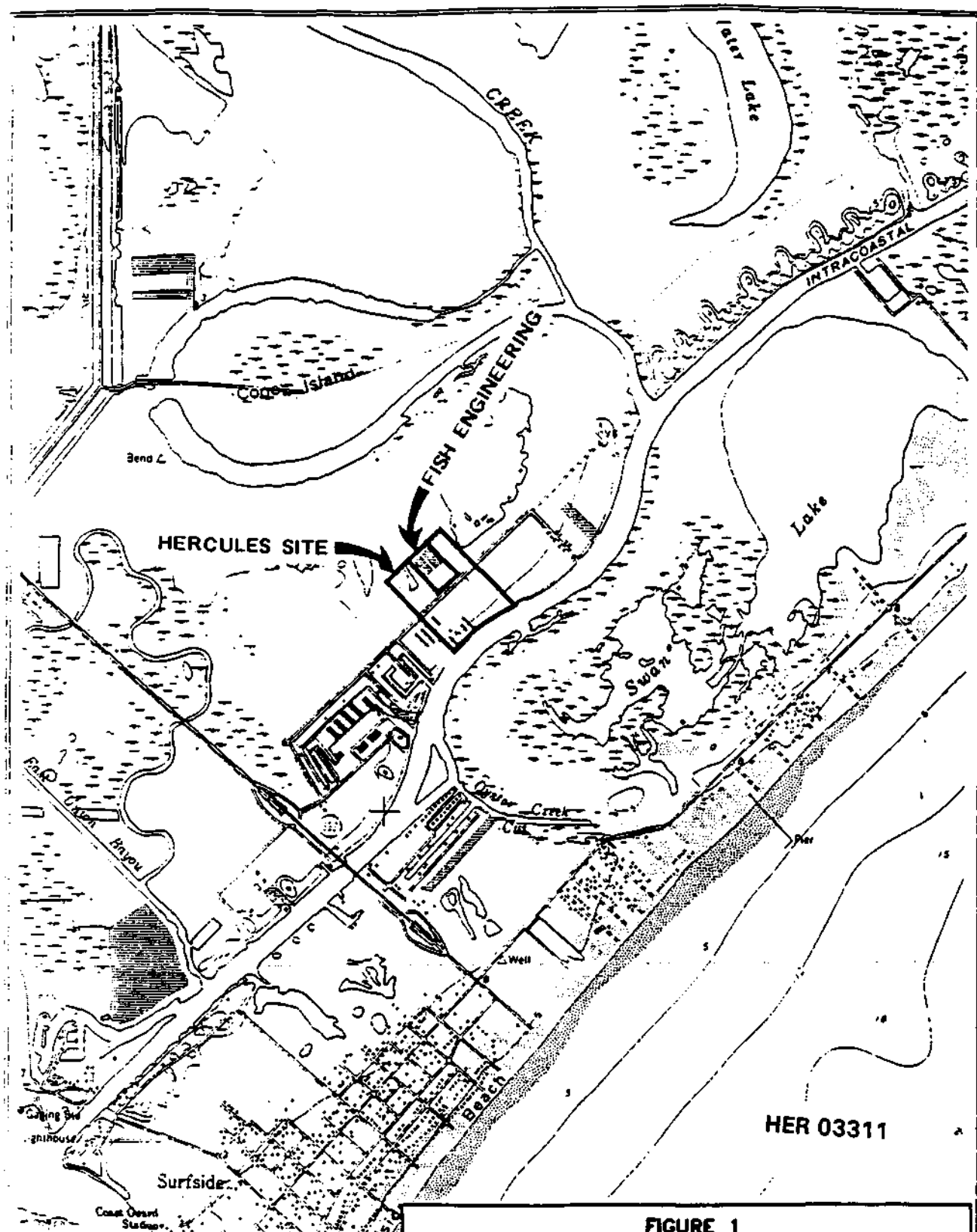


FIGURE 1

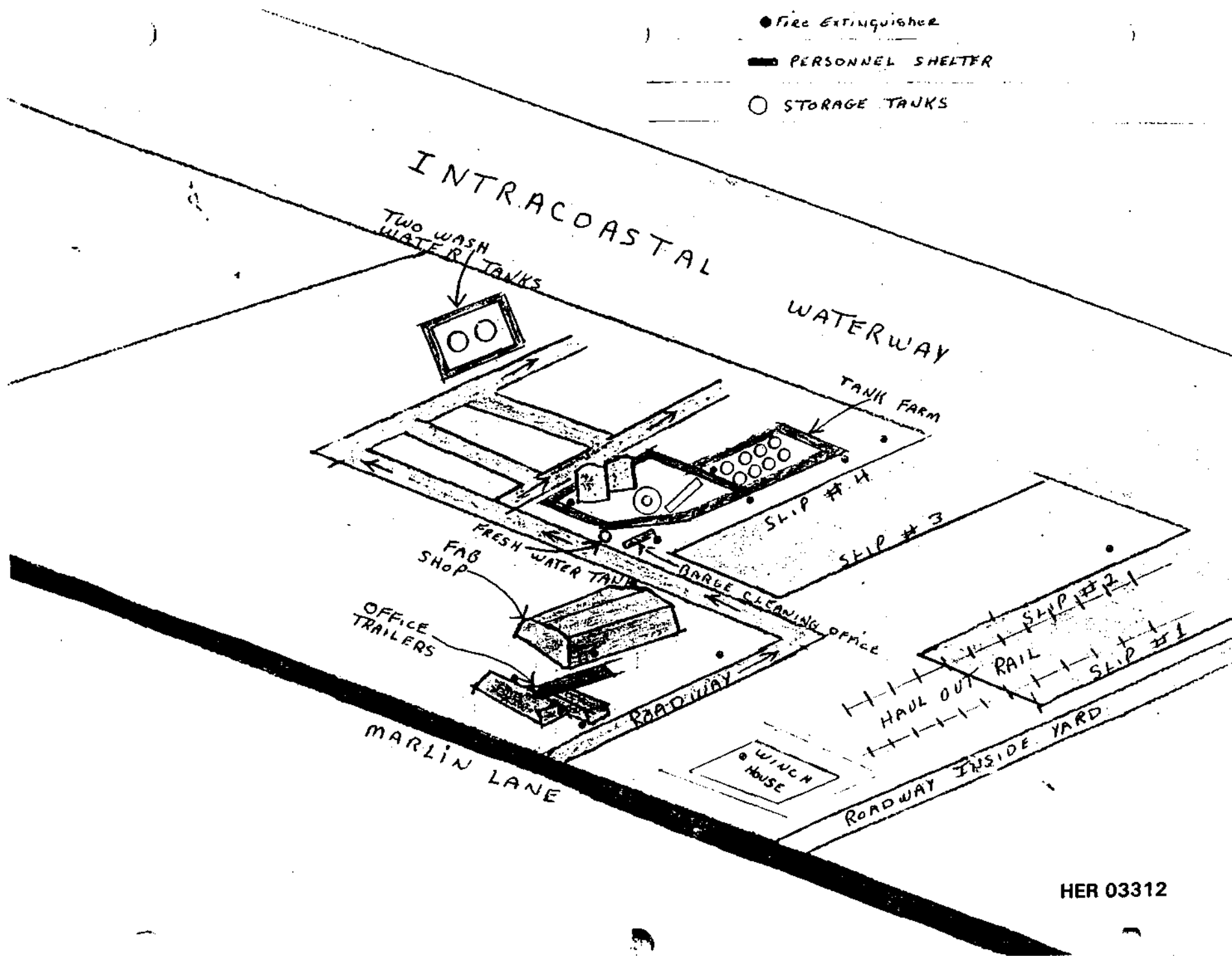
HERCULES OFFSHORE CORPORATION
FREEPORT, TEXAS
AREA MAP

BURKO & ASSOCIATES, INC.

● FIRE EXTINGUISHER

■ PERSONNEL SHELTER

○ STORAGE TANKS



HER 03312

08-06-94



FISH
ENGINEERING
PROPERTY

POND

POND

MARTIN LANE

INTRACOASTAL WATERWAY

HER 03313

0 250 500
SCALE IN FEET (APPROX.)

FIGURE 2
HERCULES OFFSHORE CORP.
PLOT PLAN
FREEPORT, TEXAS
PILKO & ASSOCIATES, INC.

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HERCULES SPECIALIZES IN THE CLEANING AND REMOVAL OF CHEMICAL LISTED BELOW AND NUMEROUS OTHER TYPES OF CONTAMINATED TANKS, BOTH HAZARDOUS AND NON-HAZARDOUS.

ACETONE
BENZENE
B.T.X.
BUTANOL
CUMENE
CYCLOHEXANE
DIESEL
DICYCLOPENTADIENE
DIETHYLENE GLYCOL
ETHYL BENZENE
2-ETHYL HEXANOL
ETHANOL
METHANOL
NAPHTHA
TOLUENE
PY-GAS
XYLENE
PROPYLENE GLYCOL
STYRENE
PIPERYLENE
V.A.M. (VINYL, ACETATE MONOMER)
RESIN OIL
UNLEADED GASOLINE
ETHYLENE DICHLORIDE
METHYLENE CHLORIDE
PROPYLENE DICHLORIDE
PERCHLOROETHYLENE
TRICHLOROETHYLENE
N. S. SOLVENT
CAUSTIC SODA
CALCIUM CHLORIDE
M.E.A. (MONOETHANOLAMINE)
M.T.B.E.
ANALON
ETHYL AND METHYL ACRYLATE
ADIPONITROLE
TETRAPROPYLENE
DIETHANOLAMINE
BUTYL ALCOHOL
ETHYLENE GLYCOL
DRIPOLENE
AMMONIA NITRATE



UNION CARBIDE CHEMICALS AND PLASTICS COMPANY INC.

Industrial Chemicals Division

MATERIAL SAFETY DATA SHEET

EFFECTIVE DATE 12/18/82



Union Carbide urges each customer or recipient of this MSDS to study it carefully to become aware of and understand the hazards associated with the product. The reader should consider consulting reference works or individuals who are experts in ventilation, toxicology, and fire prevention, as necessary or appropriate to use and understand the data contained in this MSDS.

To promote safe handling, each customer or recipient should: (1) notify its employees, agents, contractors and others whom it knows or believes will use this material of the information in this MSDS and any other information regarding hazards or safety; (2) furnish this same information to each of its customers for the product; and (3) request its customers to notify their employees, customers, and other users of the product of this information.

I. IDENTIFICATION

PRODUCT NAME:	TRIETHYLENE GLYCOL
CHEMICAL NAME:	Triethylene Glycol
CHEMICAL FAMILY:	Ethylene Glycol
FORMULA:	$\text{HO}(\text{C}_2\text{H}_4\text{O})_3\text{H}$
MOLECULAR WEIGHT:	150.17
SYNONYMS:	TEG, Glycol-bis(hydroxyethyl)ether
CAS # AND NAME:	112-27-6 Ethanol 2,2'-(1,2-ethanediylbis(oxy))bis-

II. PHYSICAL DATA (Determined on Typical Material)

BOILING POINT, 760 mm Hg:	288°C (550°F)
SPECIFIC GRAVITY(H ₂ O = 1):	1.126 AT 20/20°C
FREEZING POINT:	-4.3°C (24°F)
VAPOR PRESSURE AT 20°C:	<0.01 mmHg
VAPOR DENSITY (AIR = 1):	5.2
EVAPORATION RATE (Butyl Acetate = 1):	<0.001
SOLUBILITY IN WATER by wt:	100%

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EMERGENCY PHONE NUMBERS: 1-800-UCC-HELP (NUMBER AVAILABLE AT ALL TIMES) OR (304) 764-3487

UNION CARBIDE CHEMICALS AND PLASTICS COMPANY INC

Industrial Chemicals Division

39 Old Kingsbury Road, Danbury, CT 06817-0001

HER 03316

PRODUCT NAME: TRIETHYLENE GLYCOL

APPEARANCE: Transparent colorless

ODOR: Mild

PHYSICAL STATE: Liquid

III. INGREDIENTS

<u>%</u>	<u>MATERIAL</u>	<u>CAS#</u>	<u>EXPOSURE LIMIT</u>
>99.5	Triethylene Glycol	112-27-6	None established
0.1	Ethylene Glycol	107-21-1	50 PPM ceiling OSHA & ACGIH

IV. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT(test method(s)): 342°F
Pensky-Martens Closed Cup ASTM D 93
330°F
Cleveland Open Cup ASTM D 92

FLAMMABLE LIMITS IN AIR
% by volume: LOWER: 0.9 (Calculated)
UPPER: 9.2 (Estimated)

SPECIAL FIRE FIGHTING PROCEDURES:

Do not direct a solid stream of water or foam into hot, burning pools; this may cause frothing and increase fire intensity.
Use self-contained breathing apparatus and protective clothing.

EXTINGUISHING MEDIA:

Apply alcohol-type or all-purpose-type foam by manufacturer's recommended techniques for large fires. Use carbon dioxide or dry chemical media for small fires.

UNUSUAL FIRE AND EXPLOSION HAZARDS:

None

V. HEALTH HAZARD DATA

EXPOSURE LIMIT(S): See Section III.

EFFECTS OF SINGLE OVEREXPOSURE:

SWALLOWING:

Abdominal discomfort, nausea and vomiting may occur.

SKIN ABSORPTION:

No evidence of harmful effects from available information.

INHALATION:

Short-term harmful health effects are not expected from vapor generated at ambient temperature.
No evidence of short-term harmful effects from respirable aerosol based on available information.

PRODUCT NAME: TRIETHYLENE GLYCOL

PAGE 3

SKIN CONTACT: Sustained contact may cause mild local redness.

EYE CONTACT: No harmful effects expected from liquid. Vapor or mist may be irritating, experienced as discomfort, excess blinking and tear production, with excess redness of the conjunctiva.

EFFECTS OF REPEATED OVEREXPOSURE:

Exposure to high concentrations of aerosol generated at room temperature may cause lung injury and liver dysfunction.

MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE:

A knowledge of the available toxicology information and of the physical and chemical properties of the material suggests that overexposure is unlikely to aggravate existing medical conditions.

SIGNIFICANT LABORATORY DATA WITH POSSIBLE RELEVANCE TO HUMAN HEALTH HAZARD EVALUATION:

Triethylene glycol was given to rats by inclusion in the diet for 90 days at concentrations of 10,000, 20,000 or 50,000 ppm. At the highest dose, there were decreases in body weight. Physiologic responses to these high doses were observed in kidney weight and urinalysis. No specific organ toxicity was seen. In a 9-day repeated inhalation exposure (6 hours/day) study with rats, mortality occurred at 4284 mg/m³, at 2011 mg/m³ effects included eye irritation and increased alanine aminotransferase and alkaline phosphatase activities; at 494 mg/m³ there was slightly increased alkaline phosphatase activity. There was no evidence in developmental toxicity studies for either embryotoxic or teratogenic effects in mice or rats given triethylene glycol by gavage. Maternal toxicity was seen as reduced body weight and food consumption, increased water consumption, and increased relative kidney weight with rats, and clinical signs and increased relative kidney weight with mice. There was no histologic evidence of damage to the kidneys in either species. The no-observable effects doses for maternal toxicity were 1126 mg/kg/day for rats and 5630 mg/kg/day for mice. Minor fetotoxicity (reduced fetal body weights and increased skeletal variations) was present with doses of 11260 mg/kg/day for rats and 5630 and 11260 mg/kg/day for mice. The no-observable effect dose for fetotoxicity was 5630 mg/kg/day for rats and 563 mg/kg/day for mice.

OTHER EFFECTS OF OVEREXPOSURE:

Overexposure to vapor generated at high temperatures may result in eye and respiratory tract irritation, dizziness, nausea and the inhalation of harmful amounts of material.

EMERGENCY AND FIRST AID PROCEDURES:

SWALLOWING: No emergency care anticipated.

SKIN: Wash skin with soap and water.

INHALATION: Remove to fresh air. Give artificial respiration if not breathing. If breathing is difficult, oxygen may be given by qualified personnel. Obtain medical attention.

EYES: Flush eyes thoroughly with water for several minutes.

NOTES TO PHYSICIAN:

There is no specific antidote. Treatment of overexposure should be directed at the control of symptoms and the clinical condition of the patient.

HER 03318

PRODUCT NAME: TRIETHYLENE GLYCOL

PAGE 4

VI. REACTIVITY DATA

STABILITY: Stable

CONDITIONS TO AVOID: None known.

INCOMPATIBILITY (materials to avoid):

Explosive decomposition may occur if combined with strong acids or strong bases and subjected to elevated temperatures. Therefore, avoid strong acids and strong bases at elevated temperatures. Avoid contamination with strong oxidizing agents and materials reactive with hydroxyl compounds.

HAZARDOUS COMBUSTION OR DECOMPOSITION PRODUCTS:

Burning can produce the following combustion products:
Carbon monoxide and/or carbon dioxide.

HAZARDOUS POLYMERIZATION: W/ Not Occur

CONDITIONS TO AVOID: None known.

VII. SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:

Small spills can be flushed with large amounts of water; larger spills should be collected for disposal.

WASTE DISPOSAL METHOD:

Incinerate in a furnace where permitted under Federal, State, and local regulations.

VIII. SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (specify type):

At ambient temperature none needed for vapor.
Wear full face respirator when recurrent exposures to high aerosol concentrations may occur.

VENTILATION:

General (mechanical) room ventilation is expected to be satisfactory.

PROTECTIVE GLOVES:

PVC-coated
Rubber

EYE PROTECTION:

Monogoggles or Faceshield

OTHER PROTECTIVE EQUIPMENT:

Eye Bath, Safety Shower

IX. SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:

Caution: Repeated breathing of mist in high concentrations is harmful.
Avoid breathing mist.
Keep container closed.
Use with adequate ventilation.
Wash thoroughly after handling.

HER 03319

PRODUCT NAME: TRIETHYLENE GLYCOL

PAGE 6

FOR INDUSTRY USE ONLY

OTHER PRECAUTIONS:

WARNING: Sudden release of hot organic chemical vapors or mists from process equipment operating at elevated temperature and pressure, or sudden ingress of air into vacuum equipment, may result in ignition without the presence of obvious ignition sources. Published "autoignition" or "ignition" temperature values cannot be treated as safe operating temperatures in chemical processes without analysis of the actual process conditions.

Any use of this product in elevated-temperature processes should be thoroughly evaluated to establish and maintain safe operating conditions. Further information is available in a technical bulletin entitled "Ignition Hazards of Organic Chemical Vapors."

X. REGULATORY INFORMATION

STATUS ON SUBSTANCE LISTS:

The concentrations shown are maximum or ceiling levels (weight %) to be used for calculations for regulations. Trade Secrets are indicated by "TS".

FEDERAL EPA

Comprehensive Environmental Response Compensation, and Liability Act of 1980 (CERCLA) requires notification of the National Response Center of release of quantities of Hazardous Substances equal to or greater than the reportable quantities (RQs) in 40 CFR 302.4.

Components present in this product at a level which could require reporting under the statute are:

CHEMICAL
Ethylene Glycol

CAS NUMBER
107-21-1

UPPER BOUND
CONCENTRATION %
0.1

Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III requires emergency planning based on Threshold Planning Quantities (TPQs) and release reporting based on Reportable Quantities (RQs) in 40 CFR 355 (used for SARA 302, 304, 311 and 312).

Components present in this product at a level which could require reporting under the statute are:

NONE

Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III requires submission of annual reports of release of toxic chemicals that appear in 40 CFR 372 (for SARA 313). This information must be included in all MSDSs that are copied and distributed for this material.

Components present in this product at a level which could require reporting under the statute are:

NONE

Toxic Substances Control Act (TSCA) STATUS:

The ingredients of this product are on the TSCA inventory.

STATE RIGHT-TO-KNOW

CALIFORNIA Proposition 65

This product contains less than 1ppm Dioxane which the State of California has found to cause cancer, birth defects or other reproductive harm.

MASSACHUSETTS Right-To-Know, Substance List (MSL) Hazardous Substances and Extremadamente hazardous Substances on the MSL must be identified when present in products.

Components present in this product at a level which could require reporting under the statute are:

HER 03320

PRODUCT NAME: TRIETHYLENE GLYCOL

*** NONE ***

PENNSYLVANIA Right-to-Know, Hazardous Substance List Hazardous Substances and Special Hazardous Substances on the List must be identified when present in products.

Components present in this product at a level which could require reporting under the statute are:

HAZARDOUS SUBSTANCES (>= 1%)

CHEMICAL
Triethylene Glycol

CAS NUMBER
112-27-6

UPPER BOUND
CONCENTRATION %
100.0

CALIFORNIA SCAQMD RULE 443.1 VOC'S:

Not presently available

NOTE ----

The opinions expressed herein are those of qualified experts within Union Carbide. We believe that the information contained herein is current as of the date of this Material Safety Data Sheet. Since the use of this information and the conditions of the use of the product are not under the control of Union Carbide, it is the user's obligation to determine conditions of safe use of the product.

REVISED SECTIONS:

Revisions have occurred in the following Sections:

Section V: Effects of a Single Overexposure -

Swallowing

Inhalation

Skin Contact

Effects of Repeated Overexposure

Significant Laboratory Data

First Aid for Inhalation

Section VII: Respiratory Protection

Section IX: Precautions to take in Handling and Storage

PC: 8850B
F NUMBER: N0262F

HER 03321

525 4310

Dow Chemical U.S.A. Chemical EMERGENCY PHONE CHEMTREC 800-424-9300

Product Code: 00259

RQ

Name: ACETONE, SYNTHETIC

DOT BULK HAZ CLASS: FLAMMABLE LIQUID, UN1090

Effective date: 08/12/87 Date Printed: 01/05/89

ERTED # 000137

EMERGENCY RESPONSE INFORMATION

PRECAUTIONS AND PROTECTIVE EQUIPMENT

Keep upwind. Isolate area and deny entry. Avoid contact with eyes, skin and clothing. Do not breathe vapors. Use water spray to reduce vapor. No smoking, flares, or open flames.

CLOTHING: For SPILL/LEAK and FIRE, wear full protective clothing and self-contained breathing apparatus.

HEALTH HAZARDS:

EYES: Moderate irritation and corneal injury. Possible burn that heals fast.

SKIN: Possible slight irritation. Prolonged contact may cause drying, flaking, defatting of skin.

INHALATION: Excessive exposure may cause anesthetic or narcotic effect; may cause irritation to upper respiratory tract.

INGESTION: Low toxicity.

FIRST AID:

EYES: Irrigate with flowing water immediately and continuously for 15 minutes. Consult medical personnel.

SKIN: Wash off in flowing water or shower.

CLOTHING: Remove contaminated clothing and wash before reuse.

INHALATION: Remove to fresh air if effects occur. If not breathing, give mouth-to-mouth resuscitation. If breathing difficult, give oxygen. Call a physician.

LEAK / SPILL:

Shut off ignition and leak if without risk. Use noncombustible absorbent material/sand and shovel into suitable containers. Dike larger spills and recover. Pump into drum or other container using air-operated or other non-spark producing pump. Avoid entry into sewers and/or natural waters.

Avoid ingestion in animals.

May cause localized fish kill.

RQ: Spill of a reportable quantity must be reported.

DISPOSAL: Contact manufacturer and authorities.

FIRE:

Flammable. Do not put out any fires at vents until leak is shut off. Cool containers exposed to heat/fire with water.

SMALL FIRES: Use dry chemical, CO2, or alcohol foam.

LARGE FIRES: Use water spray, fog, or alcohol foam.

MASSIVE FIRES: Use unmanned hose holder or monitor nozzles. If this is impossible, withdraw from area and let fire burn. Dike liquid runoff. Avoid entry into sewers and/or natural waters.

Dow Chemical U.S.A. Chemical EMERGENCY PHONE CHEMTREC 800-424-9330

Product Code: 00159

RQ

Name: ACETONE, SYNTHETIC

DOT BULK HAZ CLASS: FLAMMABLE LIQUID, UN1099

Effective date: 08/12/87 Date Printed: 01/05/89

ERTED # 000137

COMPOSITION AND PRODUCT CHARACTERISTICS

COMPOSITION: (

PHYSICAL STATE AND APPEARANCE: Liquid, colorless

SOLUBILITY IN WATER: Mixes completely

FLASH PT: 0 F (TCC)

LOWER FLAM LIMIT: 2.6%

UPPER FLAM LIMIT: 12.6%

AUTO-IGNITION TEMPERATURE: Not determined

BOILING PT: 132.8 F

FREEZING PT: -137 F

SPECIFIC GRAVITY: 0.793 @ 25/25 C

WEIGHT/GAL @ 77 DEG F: 6.55 lb/gal

VAPOR DENSITY (AIR = 1): 2.0

VAPOR PRESSURE @ 30 DEG F: Not determined

VAPOR PRESSURE @ 100 DEG F: Not determined

COEFF OF THERMAL EXPANSION: Not determined

LOADING TEMPERATURE: Ambient

MAXIMUM PRODUCT TEMPERATURE: Not determined

MAXIMUM STEAM PRESSURE: Not applicable

(3) Indicates a Trademark of The Dow Chemical Company

Dow Chemical U.S.A. Chemical EMERGENCY PHONE CHEMTREC 800-424-9330

Product Code: 00159

RQ

Name: ACETONE, SYNTHETIC

DOT BULK HAZ CLASS: FLAMMABLE LIQUID, UN1099

Effective date: 08/12/87 Date Printed: 01/05/89

ERTED # 000137

TRANSPORTATION EQUIPMENT DATA

TANK TRUCK: MC 103, 106.

MC 104, 107, preferred equipment.
Stainless steel, aluminum.

TANK CAR: DOT 103M, 111A40M1, 111A100M1, 101A1M, 111A50A1M.
Aluminum, lined steel, carbon steel.

IMO CONTAINER:

INSULATION: Not required

STEAM COILS: Not required

PUMP TYPE: Stainless steel, carbon steel.
Centrifugal or positive displacement.

HOSE TYPE: Seamless stainless steel, Teflon, cross linked P/E.

GASKETS: Asbestos, Teflon

SPECIAL REQUIREMENTS:

PRECAUTIONS: FLAMMABLE, VOLATILE. Prevent ignition. Ground all equipment. No smoking or open flames. IRRITATING VAPOR. Avoid contact with eyes, skin and clothing. Avoid breathing vapors.

DRIVER PROTECTIVE EQUIPMENT: Use protective equipment - minimum of chemical worker's goggles, hard hat, rubber gloves and rubber boots. Have respirator available.

UNLOADING INSTRUCTIONS: Pump, inert gas pressure, gravity.
(Pressure not approved for MC 103 & 106 tanks.)

CLEANING AFTER UNLOADING: Drain, rinse with water, steam, rinse with water and dry.

The information herein is given in good faith, but no warranty, express or implied, is made. Consult The Dow Chemical Company for further information.

HER 03323

DRIPOLENE C (PYROLYSIS GASOLINE)

SEE MSDS FOR EXPOSURE LIMITS OF COMPONENTS

COMPONENTS/CAS#: BENZENE/71-43-2; TOLUENE/106-92-3; RAFFINATE/NO CAS#: C4+ OLEFIN AND AROMATIC HYDROCARBON MIXTURE NO CAS

DANGER!

EXTREMELY FLAMMABLE.
HARMFUL IF INHALED.
HARMFUL IF ABSORBED THROUGH SKIN.
HARMFUL IF SWALLOWED.
CAUSES EYE AND SKIN IRRITATION.
ASPIRATION MAY CAUSE LUNG DAMAGE.
CONTAINS BENZENE - CANCER HAZARD; CAUSES
BIRTH DEFECTS IN LABORATORY ANIMALS.

BEFORE HANDLING OR USING, READ AND UNDERSTAND CURRENT
UNION CARBIDE MATERIAL SAFETY DATA SHEET FOR THIS PRODUCT.

KEEP AWAY FROM HEAT, SPARKS AND FLAME.
AVOID BREATHING VAPOR.
DO NOT GET IN EYES, ON SKIN, OR CLOTHING.
DO NOT SWALLOW.

KEEP CONTAINER CLOSED.
USE WITH ADEQUATE VENTILATION.
VAPORS FROM THIS PRODUCT AND MAY TRAVEL OR BE MOVED
BY AIR CURRENTS AND IGNITED BY PILOT LIGHTS, OTHER
FLAMES, SMOKING, SPARKS, HEATERS, ELECTRICAL EQUIPMENT,
STATIC DISCHARGES OR OTHER IGNITION SOURCES AT LOCATIONS
DISTANT FROM PRODUCT HANDLING POINT.
WASH THOROUGHLY AFTER HANDLING.

FIRST AID

IF INHALED, REMOVE TO FRESH AIR. IF NOT BREATHING,
GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT,
GIVE OXYGEN. CALL A PHYSICIAN.
IN CASE OF CONTACT, IMMEDIATELY FLUSH EYES OR SKIN
WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES WHILE
REMOVING CONTAMINATED CLOTHING AND SHOES. CALL A
PHYSICIAN. WASH CLOTHING BEFORE REUSE.
IF SWALLOWED, DO NOT INDUCE VOMITING.
DO NOT GIVE ANYTHING TO DRINK.
GET MEDICAL ATTENTION URGENTLY.

FOR FIRE

USE CARBON DIOXIDE, DRY CHEMICAL, OR FOAM.
COOL WITH WATER SPRAY.

FOR SALE

SHUT OFF IGNITION SOURCES. DO NOT TURN ON
UNTIL AREA SAFETY DETERMINED.
COVER WITH ABSORBENT OR CONTAIN. COLLECT AND DISPOSE.
WEAR SUITABLE PROTECTIVE EQUIPMENT.
OBSERVE GOVERNMENT REGULATIONS.
DRINKING WATER AND MARINE LIFE HAZARDS.
AVOID RUNOFF TO WATERWAYS AND SEWERS.

INDUSTRIAL CHEMICALS DIVISION

UCC-T30106 10-20-92

NOTICE!

AVOID BREATHING VAPORS.
THIS PRODUCT CONTAINS COMPONENTS
WHICH THE STATE OF CALIFORNIA
HAS FOUND TO BE "CANCER, BIRTH
DEFECTS OR DNA REPRODUCING HAZARD"

HER 03324

ATTENTION!

FOR INDUSTRY USE ONLY

UNION CARBIDE CHEMICALS AND PLASTICS COMPANY, INC.

2000 W. 10TH AVE., SANDHURST, NJ 08080-1000

MADE IN U.S.A.

U.S. COAST GUARD EMERGENCY RESPONSE CENTER: 1-800-424-8802

EMERGENCY CONTACTS (24 HOURS PER DAY): UCC DANGER OPERATIONS: 1-800-357-6805 AND

U.S. COAST GUARD EMERGENCY RESPONSE CENTER: 1-800-424-8802

THIS TAG HAS IMPORTANT SAFETY INFORMATION AND IS NOT TO BE
REMOVED UNTIL AFTER THE EQUIPMENT IS CLEANED OR UNLOADED!

PRODUCT RESIDUE
EMPTYED CONTAINERS MUST BE KEPT AWAY
FROM CHILDREN AND DOGS.
DO NOT CUT OR WELD ON OR NEAR ANY CONTAINER IF
IT CONTAINS RESIDUE.
OBEY ALL LABEL WARNINGS, ESPECIALLY DURING
CONTAINER CLEANING.
REFER TO ALL FEDERAL, STATE, AND LOCAL REGULATIONS
PRIORITY TO DISPOSITION OF CONTENTS BY REUSE,
RECYCLE, OR DISPOSAL.

PC-30106

D. O. T. SHIPPING NAME	RQ, FLAMMABLE LIQUID, N. O. S. (BENZENE HYDROCARBON MIXTURE)		
HAZARD CLASS 3	TD NUMBER UN 1993		

FOR CHEMICAL EMERGENCY - CALL 1-800-424-9300 IN THE U.S.A.
(1-202-483-7616 OUTSIDE THE CONTINENTAL U.S. AND IN WASHINGTON, D.C.)

EMERGENCY RESPONSE INFORMATION

RESIN OIL 60

DOT

FLAMMABLE
LIQUID
UN1993

RQ*

COMPOSITION: STYRENE 15%, DICYCLOPENTADIENE 40-50%;
REMAINDER OLEFINS AND AROMATIC COMPONENTS.

FORM: LIQUID

SPECIFIC GRAVITY: 0.963

PHYSICAL

PROPERTIES:

SOLUBILITY IN WATER: DOES NOT MIX

FREEZING POINT: -20°F

BOILING POINT: 198-388°F

FLASH POINT: 60°F (TCC)

FLAMMABLE LIMITS: 1-7%

VAPOR HAZARD:

REACTS WITH: ACIDS AND

OXIDIZING MATERIAL.

HAZARDS

ENVIRONMENT:

ANIMAL: TOXIC. KEEP ANIMALS AWAY.

FISH: TOXIC. PREVENT ENTRY INTO NATURAL WATERS. WILL CAUSE FISH KILL.

EXPOSURE:

EYES: SLIGHT IRRITATION.

SKIN: SLIGHT IRRITATION.

INHALATION: DROWSINESS, UNCONSCIOUSNESS.

INGESTION: LOW TOXICITY, BUT TOXIC IF ASPIRATED INTO LUNGS.

IN CASE OF ACCIDENT

SPILL
or
LEAK

FLAMMABLE. VAPOR IRRITATING. KEEP UPWIND. ISOLATE AREA AND DENY ENTRY. AVOID CONTACT WITH EYES, SKIN AND CLOTHING. AVOID BREATHING VAPORS.

USE WATER SPRAY TO REDUCE VAPOR. NO SMOKING, FLARES, OR OPEN FLAMES.

SHUT OFF IGNITION AND LEAK IF WITHOUT RISK. USE NONCOMBUSTIBLE ABSORBENT MATERIAL/SAND AND SHOVEL INTO SUITABLE CONTAINERS. DIKE LARGER SPILLS AND RECOVER. PREVENT ENTRY INTO SEWERS AND/OR NATURAL WATERS.

CLOTHING: WEAR FULL PROTECTIVE CLOTHING AND SELF-CONTAINED BREATHING APPARATUS.

DISPOSAL: CONTACT MANUFACTURER AND AUTHORITIES.

*RQ: SPILL OF REPORTABLE QUANTITY MUST BE REPORTED.

HER 03325

FIRE

FLAMMABLE. VAPOR IRRITATING.

DO NOT PUT OUT ANY FIRES AT VENTS UNTIL LEAK IS SHUT OFF.

SMALL FIRES: USE DRY CHEMICAL OR CO₂.

LARGE FIRES: USE WATER SPRAY, FOG, OR FOAM. IF MASSIVE FIRE: USE UNMANNED HOSE HOLDER OR MONITOR NOZZLES. IF THIS IS IMPOSSIBLE, WITHDRAW FROM AREA AND LET FIRE BURN.

DIKE LIQUID RUN-OFF. PREVENT ENTRY INTO SEWERS AND/OR NATURAL WATERS.

CLOTHING: WEAR FULL PROTECTIVE CLOTHING AND SELF-CONTAINED BREATHING APPARATUS.

FIRST
AID

EYES: IRRIGATION IMMEDIATELY WITH WATER FOR 5 MINUTES IS GOOD SAFETY PRACTICE.

SKIN: IMMEDIATELY FLUSH WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES WHILE REMOVING CONTAMINATED CLOTHING. CONSULT MEDICAL PERSONNEL.

CLOTHING: REMOVE CONTAMINATED CLOTHING IMMEDIATELY AND WASH BEFORE REUSE. DESTROY CONTAMINATED SHOES AND LEATHER ITEMS.

INHALATION: REMOVE TO FRESH AIR IF EFFECTS OCCUR. IF NOT BREATHING, GIVE MOUTH-TO-MOUTH RESUSCITATION. IF BREATHING DIFFICULT, GIVE OXYGEN. CALL A PHYSICIAN.

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TRANSPORTATION EQUIPMENT DATA

- EMERGENCY DATA
ON OTHER SIDE -

OIL 60		CODE NO. 71285	DATE ISSUED OR REVISED R-09-15-81
DOT SHIPPING NAME RQ/Flammable Liquid, n.o.s.		TYPE COMMODITY Resin Forming Material	
DOT HAZARD CLASS Flammable Liquid			
FLASH POINT 60°F (TCC)	FLAMMABLE LIMITS n.o.s.	BOILING POINT 198-388°F	VAPOR DENSITY (AIR = 1) Greater than air
FREEZING POINT -20°F	LOADING TEMP. Ambient	MAX. PRODUCT TEMP. ---	MAX. STEAM PRESSURE ---
WT/GAL @ 15.6°F (5°C) 7.78 - 8.07	CONCENTRATION SHIPPED Full strength	SOLUBILITY IN WATER Does not mix	PHYSICAL STATE Liquid

APPROVED EQUIPMENT:

	TANK TRUCK	TANK CAR
TANK TYPE:	MC 303(1), 304(2), 306(1), 307(2)	DOT 103W, 111A60W1, 111A100W1, 103ALW, 111A60ALW
TANK MATERIALS:	Stainless steel, aluminum, lined steel	Carbon steel, aluminum lined steel.
INSULATION:	None	None
STEAMCOILS:	None	None
METHOD USED TO CLEAN TANK:	Drain, flush with water, hot caustic wash, rinse and dry.	Drain, steam, boil with 10% caustic solution, rinse and dry.
PUMP TYPES:	Stainless steel, carbon steel Centrifugal or positive displacement	
SEAL TYPES:	Seamless stainless steel, Teflon, seamless bronze, Viton, cross-linked P/E.	
GASKETS:	Teflon, seamless bronze, Viton, Spiral wound 304 stainless steel, asbestos with outer compression ring.	
OTHER:	(1) Must be equipped with pressure hatch - 25 psig min. (2) Preferred equipment.	

HANDLING:

HOW UNLOADED:	Pump
PROBLEMS:	FLAMMABLE. PREVENT IGNITION. GROUND AND BOND EQUIPMENT. NO SMOKING OR OPEN FLAMES. VAPOR IRRITATING. AVOID CONTACT WITH EYES, SKIN AND CLOTHING. AVOID BREATHING VAPORS.
PRECAUTIONS:	USE PROTECTIVE EQUIPMENT - MINIMUM OF CHEMICAL WORKER'S GOGGLES, HARD HAT, RUBBER GLOVES, RUBBER BOOTS. HAVE RESPIRATOR AVAILABLE.
OTHER:	

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HER 03326

FOR CHEMICAL EMERGENCY - CALL 1-800-424-9300 IN THE U.S.A.
(1-202-483-7616 OUTSIDE THE CONTINENTAL U.S. AND IN WASHINGTON, D.C.)

EMERGENCY RESPONSE INFORMATION

PROPYLENE GLYCOL "IND."
(PROPANDIOL)

COMPOSITION:

FORM: LIQUID, COLORLESS

FLAMMABLE LIMITS: 2.6% - 12.5%

DENSITY: 1.0362

VAPOR HAZARD:

PHYSICAL

SOLUBILITY IN WATER: MIXES COMPLETELY

PROPERTIES:

FREEZING POINT: SUPERCOOLS

REACTS WITH: OXIDIZING MATERIAL

BOILING POINT: 370°F

FLASH POINT: 214°F (TCC)

HAZARDS

ENVIRONMENT: ANIMAL: AVOID INGESTION.

FISH: AVOID ENTRY INTO NATURAL WATERS. MAY CAUSE LOCALIZED FISH KILL.

EXPOSURE:

EYES: ESSENTIALLY NO EFFECT.

SKIN: ESSENTIALLY NO EFFECT.

INHALATION: VERY LOW HAZARD.

INGESTION: VERY LOW HAZARD.

IN CASE OF ACCIDENT

SPILL or LEAK

AVOID EYE AND SKIN CONTACT. AVOID BREATHING VAPORS IF ANY.

NO SMOKING, FLARES OR OPEN FLAMES.

SHUT OFF IGNITION AND LEAK IF WITHOUT RISK.

AVOID ENTRY INTO SEWERS OR NATURAL WATERS.

USE ABSORBENT OR SAND ON SMALL SPILLS AND SCOOP INTO WASTE CONTAINERS.

DIKE LARGER SPILLS AND RECOVER.

CLOTHING: WEAR FULL PROTECTIVE CLOTHING.

DISPOSAL: CONTACT MANUFACTURER AND AUTHORITIES.

FIRE

WILL BURN BUT DOES NOT IGNITE EASILY.

COOL CONTAINERS WITH WATER IF EXPOSED TO FIRE TO PREVENT BURSTING.

SMALL FIRE: USE DRY CHEMICAL OR CARBON DIOXIDE.

LARGE FIRE: USE WATER FOG OR SPRAY OR ALCOHOL FOAM. DIKE WATER RUNOFF.

PREVENT ENTRY INTO SEWERS OR NATURAL WATERS.

CLOTHING: WEAR FULL TURN OUT CLOTHING AND SELF-CONTAINED BREATHING EQUIPMENT.

FIRST AID

EYES: IRRIGATION IMMEDIATELY WITH WATER FOR 5 MIN IS GOOD SAFETY PRACTICE.

SKIN: WASH OFF IN FLOWING WATER OR SHOWER.

CLOTHING: REMOVE CONTAMINATED CLOTHING AND WASH BEFORE REUSE.

INHALATION: REMOVE TO FRESH AIR IF EFFECTS OCCUR.

CONSULT MEDICAL PERSONNEL.

HER 03327

TRANSPORTATION EQUIPMENT DATA - EMERGENCY DATA ON OTHER SIDE

PROPYLENE GLYCOL IND.

CODE NO. 70511

DATE ISSUED OR REVISED: R-09-22-80

CHARACTERISTICS	Propandiol		TYPE COMMONLY Glycol	
	DOT SHIPPING NAME		DOT HAZARD CLASS	
	FLASH POINT		BOILING POINT	
	214°F (TCC)		370°F	
	FREEZING POINT		MAX. PRODUCT TEMP.	
	Supercools		80°F (1)	
	WT/GAL = 11.9° F (11°C)		SOLUBILITY IN WATER	
	8.61		Mixes completely	
	CONCENTRATION SHIPPED		PHYSICAL STATE	
	Full strength		Liquid	

APPROVED EQUIPMENT:

	TANK TRUCK	TANK CAR
TANK TYPE	MC 303, 304, 306, 307	111A60-W1, 111A100W1 DOT 103ALW, 111A60ALW-W
TANK MATERIALS	Stainless, aluminum, lined steel	Aluminum, carbon steel lined
INSULATION	Required in severe weather	Required in cold weather
STEAMCOILS	Not required	Required in cold weather
METHOD USED TO CLEAN TANK	Drain, flush with warm water, steam, wash thoroughly with water and dry.	Drain, butterworth with hot water, cool and dry.
MP TYPES	Stainless, carbon steel, air pressure. Centrifugal or positive displacement	
HOSE TYPES	Seamless stainless, Teflon, Viton, Hypalon, Neoprene, seamless bronze	
GASKETS	Asbestos, Teflon, Viton, Neoprene (leather - single use only).	
OTHER	(1) TO HEAT, USE ATMOSPHERIC STEAM. ONLY CONDENSATE SHOULD COME FROM COILS.	

HANDLING:

HOW UNLOADED	Pump or air pressure. (Pressure NOT approved for MC 303 and 306 tanks)
PROBLEMS	AVOID PERSONAL CONTACT. AVOID BREATHING VAPORS OR MIST IF ANY.
PRECAUTIONS	USE PROTECTIVE EQUIPMENT - MINIMUM OF CHEMICAL WORKERS GOGGLES HARD HAT, RUBBER GLOVES.
HER:	

HER 03328

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202-483-7616 OUTSIDE THE CONTINENTAL U.S. AND IN WASHINGTON, D.C.)
EMERGENCY RESPONSE INFORMATION SHEET

C. 12912

N-BUTANOL

DOT **FLAMMABLE**
LIQUID
HALL20

FORM: LIQUID, CLEAR
SPECIFIC GRAVITY: 0.8
SOLUBILITY IN WATER: MIXES SLIGHTLY
FREEZING POINT: -128°F
BOILING POINT: 243.9°F
FLASH POINT: 97°F (TCC)

FLAMMABLE LIMITS: 1.4% - 11.2%
VAPOR HAZARD: FLAMMABLE,
IRRITATING.
REACTS WITH: OXIDIZING MATERIALS,
COPPER AND ITS ALLOYS.

HEALTH HAZARDS

ANIMAL: AVOID INGESTION. AVOID EXPOSURE.
FISH: AVOID ENTRY INTO NATURAL WATERS. MAY CAUSE LOCALIZED FISH KILL.
EYES: MODERATE BURN. MODERATE IRRITATION.
SKIN: MODERATE IRRITATION; TOXIC BY ABSORPTION UPON CROSS CONTACT.
INHALATION: SLIGHTLY IRRITATING. DROWSINESS, UNCONSCIOUSNESS.
INGESTION: LOW TOXICITY.

IN CASE OF ACCIDENT

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K**

FLAMMABLE. IRRITATING. KEEP UPWIND. ISOLATE AREA AND DENY ENTRY.
DO NOT GET IN EYES. AVOID CONTACT WITH SKIN. AVOID BREATHING VAPORS.
USE WATER SPRAY TO REDUCE VAPOR. NO SMOKING, FLARES, OR OPEN FLAMES.
SHUT OFF IGNITION AND LEAK IF WITHOUT RISK. USE NONCOMBUSTIBLE ABSORBENT
MATERIAL/SAND AND SHOVEL INTO SUITABLE CONTAINERS.
DIKE LARGER SPILLS AND RECOVER. AVOID ENTRY INTO SEWERS AND/OR NATURAL
WATERS.
CLOTHING: WEAR FULL PROTECTIVE CLOTHING AND SELF-CONTAINED BREATHING
APPARATUS.
DISPOSAL: CONTACT MANUFACTURER AND AUTHORITIES.

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FLAMMABLE. IRRITATING.
DO NOT PUT OUT ANY FIRES AT VENTS UNTIL LEAK IS SHUT OFF.
MAY DECOMPOSE IN HEAT/FIRE RELEASING PRODUCTS OF GREATER HAZARD.
COOL CONTAINERS EXPOSED TO HEAT/FIRE WITH WATER TO PREVENT BURSTING.
SMALL FIRES: USE DRY CHEMICAL OR CO₂.
LARGE FIRES: USE WATER SPRAY, FOG, OR ALCOHOL FOAM. IF MASSIVE FIRE:
USE UNMANNED HOSE HOLDER OR MONITOR NOZZLES. IF THIS IS IMPOSSIBLE,
WITHDRAW FROM AREA AND LET FIRE BURN. DIKE LIQUID RUN-OFF.
AVOID ENTRY INTO SEWERS AND/OR NATURAL WATERS.

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EYES: IRRIGATE WITH FLOWING WATER IMMEDIATELY AND CONTINUOUSLY FOR 15
MINUTES. CONSULT MEDICAL PERSONNEL.
SKIN: IMMEDIATELY FLUSH WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES
WHILE REMOVING CONTAMINATED CLOTHING. CONSULT MEDICAL PERSONNEL.
CLOTHING: REMOVE CONTAMINATED CLOTHING IMMEDIATELY AND WASH BEFORE
REUSE. DESTROY CONTAMINATED SHOES AND LEATHER ITEMS.
INHALATION: REMOVE TO FRESH AIR IF EFFECTS OCCUR. CONSULT MEDICAL
PERSONNEL.

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Form C-1000 Printed 8/80



DOW CHEMICAL U.S.A.

R-04-01-91

HER 03329

STYRENE		STY
Common Synonyms Styrol Vinylbenzene Phenylethylene	Watery liquid Colorless to light yellow Sweet pleasant odor Floats on water. Flammable, irritating vapor is produced.	

Avoid contact with liquid and vapor. Keep people away.
 Wear chemical protective suit with self-contained breathing apparatus.
 Stop discharge if possible.
 Call fire department.
 Isolate and remove discharged material.
 Notify local health and pollution control agencies.

Fire	FLAMMABLE CONTAINERS MAY EXPLODE IN FIRE. Flashback along vapor trail may occur. Vapor may explode if ignited in an enclosed area. Wear chemical protective suit with self-contained breathing apparatus. Combat fires from safe distance or protected location. Extinguish with dry chemical, foam, or carbon dioxide. Water may be ineffective on fire. Cool exposed containers with water.
Exposure	CALL FOR MEDICAL AID. VAPOR Irritating to eyes, nose and throat. If inhaled, will cause dizziness or loss of consciousness. Move to fresh air. If breathing has stopped, give artificial respiration. If breathing is difficult, give oxygen. LIQUID Will burn skin and eyes. Harmful if swallowed. Remove contaminated clothing and shoes. Flush affected areas with plenty of water. IF IN EYES, hold eyelids open and flush with plenty of water. IF SWALLOWED and victim is CONSCIOUS, have victim drink water or milk. DO NOT INDUCE VOMITING.
Water Pollution	HARMFUL TO AQUATIC LIFE IN VERY LOW CONCENTRATIONS. Fouling to shoreline. May be dangerous if it enters water intakes. Notify local health and wildlife officials. Notify operators of nearby water intakes.

Xylene

Synonyms Xylol

Formula $C_8H_{10}(CH_3)_2$

Appearance-Color

Specific Gravity

Chemical Family Aromatic hydrocarbon

Boiling Point ($^{\circ}F$)..... varies

Vapor Pressure 20 $^{\circ}C$ (mmHg)...

Weld Vapor Pressure (mmHg)...

Vapor Density (air = 1).....

Freezing Point ($^{\circ}F$).....

Solubility in Water..... Slight

FIRE & EXPLOSION HAZARD DATA

Grade C Flammable or D combustible, depending on composition; see remarks. Limited The vapors are more toxic than those of comparable petroleum products.

Flash Point ($^{\circ}F$) 100 $^{\circ}$

Flammable Limits.....

Autoignition Temp. ($^{\circ}F$)..

Extinguishing Media CO $_2$, dry chemical, foam, water fog

Special Fire Precautions... A fire should be fought in the same manner as in any Grade C or D petroleum product.

HEALTH HAZARD DATA

Health Hazard Rating
1,1,2

Odor Threshold (ppm)

TLV (ppm)
200

Symptoms Dizziness, nausea, headache

Short Exposure Toxicity

Exposure Procedure Vapor - remove victim to fresh air; if breathing stops, apply artificial respiration. Skin or eye contact - remove contaminated clothing and gently flush affected areas with water for 15 minutes. Get medical advice or attention.

REACTIVITY DATA

Stability Xylene is a stable compound.

Compatibility

Material: Softens rubber. Xylene is not corrosive to most metals.

Caution: Group 10 of compatibility chart.

SPILL OR LEAK PROCEDURE

Avoid contact with liquid. Secure ignition sources. If a spill occurs into navigable water, notify State water pollution or public health agency and the nearest Captain of the Port, U.S. Coast Guard.

Remarks: Xylene is a mixture of three isomers; ortho, meta, and para. The physical, fire and toxic properties will vary depending on the composition. Usually the meta and para isomers predominate.

UNCLASIFIED

100

HER 03331

METHYL TERT-BUTYL ETHER

Synonyms—tert-Butyl methyl ether; MTBE

United Nations Number..... 2300

Formula— $(CH_3)_3COCH_3$

CHIRIS Code..... MBF

Appearance—Odor—Clear, colorless liquid; sharp, turpene-like odor

Boiling Point..... 55°C 131°F

Specific Gravity—0.74 at 20°C

Freezing Point..... -109°C -164°F

Chemical Family—Alkyl ethers

Vapor Pressure 20°C (68°F) (mmHg)..... 7.4

Pollution Category—USEPA _____ IMO D

Vapor Pressure 44°C (111°F) (psia)..... 3.1

Applicable Bulk Reg. 46 CFR Subchapter _____ D

Vapor Density (Air = 1.0)..... 3.1

Solubility in Water..... Complete

FIRE & EXPLOSION HAZARD DATA

Grade—C: Flammable liquid
Electrical Group—C

General—Flammable and, when confined, explosive. Flashback along vapor trail may occur.

Flash Point (°F)..... -14 (cc)
Flammable Limits..... 1.6 to 8.4%
Autoignition Temp. (°F)..... 797
Extinguishing Agents..... Alcohol foam, dry chemical, CO_2
Special Fire Procedures..... Cool exposed tanks with water spray.

HEALTH HAZARD DATA

Health Hazard Ratings	Odor Threshold (ppm)	PEL/TWA (ppm)	TLV/TWA (ppm)
Unavailable	Unavailable	Unavailable	0.25

General—Not too toxic, similar to gasoline.

Symptoms—Irritates eyes, skin, mucous membranes. Inhalation: For prolonged exposure, coughing, shortness of breath, dizziness, intoxication. For short exposure, dizziness.

Short Exposure Tolerance—

Exposure Procedures—Inhalation: Remove to fresh air, give oxygen or artificial respiration as needed. Eyes: Flush with water for at least 15 minutes, hold eyelids open, call physician. Skin: Wash with water. Ingestion: Do not induce vomiting.

REACTIVITY DATA

Stability—Generally stable. Forms peroxides at much slower rate than most ethers. Reacts with mineral acids, organic acids, other oxidizers.

Compatibility—Material: Compatible with steel, iron, aluminum, copper, magnesium, zinc, neoprene, polyethylene, polypropylene. Incompatible with viton elastomer.

Charge: Group 41 of compatibility chart. See also Appendix I—Exceptions to the Chart.

SPILL OR LEAK PROCEDURE

Stop release, remove all ignition sources. Dike to prevent spill from entering sewers (explosion hazard, pollution) or waterways. Remove spill with inert absorbent. Wear goggles or face shield, boots, and use self-contained breathing apparatus if spill large or in confined area.

If a spill occurs, call the National Response Center, 800-424-6802.

HER 03332

TOLUENE

Synonyms—Benzene, methyl-; Methacido;
Methylbenzene; Methylbenzol; Phenylmethane;
Toluol

United Nations Number.....1204

CIIRIS Code.....TOL

Formula— $C_6H_5CH_3$

Appearance—Odor—Colorless liquid; benzene-like odor

Specific Gravity—0.87

Chemical Family—Aromatic hydrocarbon

Pollution Category—USEPA—C IMO—C*

Applicable Bulk Reg. 46 CFR Subchapter.....D.O.

Boiling Point.....111°C.....231°F

Freezing Point.....-95°C.....-139°F

Vapor Pressure 20°C (68°F) (mmHg).....0.04

Heid Vapor Pressure (psia).....1.1

Vapor Pressure 46°C (115°F) (psia).....1.5

Vapor Density (Air = 1.0).....3.14

Solubility in Water.....Negligible

FIRE & EXPLOSION HAZARD DATA

Grade—C: Flammable liquid
Electrical Group—D

General—Dangerous fire hazard when exposed to heat or flame; moderate explosion hazard when exposed to flame.

Flash Point (°F).....45

Flammable Limits.....1.27 to 7.0%

Autoignition Temp. (°F).....1026

Extinguishing Agents.....CO₂, dry chemical, foam, water fog

Special Fire Procedures.....Fight the same as a petroleum fire. The vapors are more toxic than those of petroleum and should be avoided. A fire should be fought in the same manner as any Grade C flammable petroleum product.

HEALTH HAZARD DATA

Health Hazard Ratings	Odor Threshold (ppm)	PEL/TWA (ppm)	TLV/TWA (ppm)
1, 1, 2	0.17	100	100

General—Liquid slightly irritating. Vapor inhalation has moderate narcotic effect causing dizziness and headache, with severe fatigue and mental confusion.

Symptoms—Nausea, dizziness and headache. The victim may appear to be drunk.

Short Exposure Tolerance—Inhalation of 800 ppm for 30 minutes has caused severe fatigue, mental confusion, nausea, dizziness and headache.

Exposure Procedures—Ingestion—do NOT induce vomiting. Vapor—remove victim to fresh air; if breathing stops, apply artificial respiration. Skin or eye contact—remove contaminated clothing and gently flush affected areas with water for 15 minutes. Get medical advice or attention.

REACTIVITY DATA

Stability—Stable.

Compatibility—Material: Rubber exposed to toluene will swell, soften, and deteriorate. Most metals are compatible with toluene.

Charge: Group 32 of compatibility chart.

SPILL OR LEAK PROCEDURE

Wear plastic gloves, face shield, protective clothing. Have all-purpose canister mask available. Avoid contact with liquid. Secure ignition sources.

If a spill occurs, call the National Response Center, 800-424-8802.

HER 03333



UNION CARBIDE CHEMICALS AND PLASTICS COMPANY INC.

Industrial Chemicals Division

MATERIAL SAFETY DATA SHEET

EFFECTIVE DATE 07/15/92



Union Carbide urges each customer or recipient of this MSDS to study it carefully to become aware of and understand the hazards associated with the product. The reader should consider consulting reference works or individuals who are experts in ventilation, toxicology, and fire prevention, as necessary or appropriate to use and understand the data contained in this MSDS.

To promote safe handling, each customer or recipient should: (1) notify its employees, agents, contractors and others whom it knows or believes will use this material or the information in this MSDS and any other information regarding hazards or safety; (2) furnish this same information to each of its customers for the product; and (3) request its customers to notify their employees, customers, and other users of the product of this information.

I. IDENTIFICATION

PRODUCT NAME: ETHYLENE GLYCOL BY-PRODUCT

CHEMICAL NAME: Ethylene Glycol (Mixture)

CHEMICAL FAMILY: Glycols

FORMULA: Not Applicable

MOLECULAR WEIGHT: Not Applicable

SYNONYMS: PCC: 36535, 36536, 35160, 36226

CAS # AND NAME: Not Applicable (mixture)

II. PHYSICAL DATA (Determined on Typical Material)

BOILING POINT, 760 mm Hg: 135.9°C

SPECIFIC GRAVITY (H₂O = 1): 1.12 AT 20/20°C

FREEZING POINT: <-75°C (<-103°F)

VAPOR PRESSURE AT 20°C: 4.08 mmHg

VAPOR DENSITY (AIR = 1): Apx 1.6

EVAPORATION RATE (Butyl Acetate = 1): Apx 0.3

SOLUBILITY IN WATER by wt: 100%

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EMERGENCY PHONE NUMBERS: 1-800-UCC-HELP (NUMBER AVAILABLE AT ALL TIMES) OR (304) 744-3467

UNION CARBIDE CHEMICALS AND PLASTICS COMPANY INC
Industrial Chemicals Division
39 Old Ridgebury Road, Danbury, CT 06817-0001

HER 03334

PRODUCT NAME: ETHYLENE GLYCOL BY-PRODUCT

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APPEARANCE: Pale yellow

ODOR: Acid

PHYSICAL STATE: Liquid

III. INGREDIENTS

%	MATERIAL	CAS#	EXPOSURE LIMIT
50-95	Ethylene Glycol	107-21-1	See Section V
0-5	Bis (Hydroxyethyl) Terephthalate	959-26-2	None established
0-2	Monohydroxyethyl-Terephthalate	1137-99-1	None established
0-2	Terephthalic Acid	100-21-0	None established
0-2	Oligomeric Esters		None established
0-2	Diethylene Glycol	111-46-6	None established
0-0.1	Antimony Salts		None established

IV. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (test method(s)): 241°F, Tag Closed Cup (116°C) (Values for Ethylene Glycol) ASTM D 56
240°F, Cleveland Open Cup (116°C) (Values for Ethylene Glycol) ASTM D 92

FLAMMABLE LIMITS IN AIR
% by volume: LOWER: 3.2 (Ethylene Glycol)
UPPER: 15.3 (Ethylene Glycol)

SPECIAL FIRE FIGHTING PROCEDURES: Use self-contained breathing apparatus and protective clothing.

EXTINGUISHING MEDIA: Apply alcohol-type or all-purpose-type foam by manufacturer's recommended techniques for large fires. Use carbon dioxide or dry chemical media for small fires.

UNUSUAL FIRE AND EXPLOSION HAZARDS: None

V. HEALTH HAZARD DATA

EXPOSURE LIMIT(S): Ethylene Glycol: 50 ppm Ceiling, OSHA & ACGIH

EFFECTS OF SINGLE OVEREXPOSURE:

SWALLOWING: May cause abdominal discomfort or pain, nausea, vomiting, dizziness, drowsiness, malaise, blurring of vision, irritability, lumbar pain, oliguria, uremia, and central nervous system effects, including irregular eye movements, convulsions and coma. Cardiac failure and pulmonary edema may develop. Severe kidney damage follows the swallowing of large volumes of ethylene glycol. May be fatal. A few reports have been published describing the development of weakness of the facial muscles, diminished hearing, and difficulty with swallowing, during the late stages of severe poisoning.

HER 03335

SKIN ABSORPTION:	No evidence of harmful effects from available information.
INHALATION:	May cause irritation of the nose and throat with headache, particularly from mist. High vapor concentrations caused, for example, by heating the material in an enclosed and poorly ventilated workplace, may produce nausea, vomiting, headache, dizziness, and irregular eye movements.
SKIN CONTACT:	Brief contact may cause slight irritation with itching and local redness.
EYE CONTACT:	Injury to the cornea is not expected. Liquid, vapor, or mist causes irritation, experienced as stinging, excess blinking and tear production, with excess redness of the conjunctiva.

EFFECTS OF REPEATED OVEREXPOSURE:

Repeated inhalation of ethylene glycol mist may produce signs of central nervous system involvement, particularly dizziness and nystagmus.

MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE:

May aggravate an existing kidney disease.

SIGNIFICANT LABORATORY DATA WITH POSSIBLE RELEVANCE TO HUMAN HEALTH HAZARD EVALUATION:

Ethylene glycol has been shown to produce dose-related teratogenic effects in rats and mice when given by gavage or in drinking water at high concentrations or doses. The no-effect doses for developmental toxicity for ethylene glycol given by gavage over the period of organogenesis has been shown to be 150 mg/kg/day for the mouse and 500 mg/kg/day for the rat. Also, in a preliminary study to assess the effects of exposure of pregnant rats and mice to aerosols at concentrations of 150, 1000 and 2500 mg/m³ for 6 hours a day throughout the period of organogenesis, teratogenic effects were produced at the highest concentration, but only in mice. The conditions of these latter experiments did not allow a conclusion as to whether the developmental toxicity was mediated by inhalation of aerosol, percutaneous absorption of ethylene glycol from contaminated skin, or swallowing of ethylene glycol as a result of grooming the wetted coat. In a further study, comparing effects from high aerosol concentration by whole-body or nose-only exposure, it was shown that nose-only exposure resulted in maternal toxicity (1000 and 2500 mg/m³) and developmental toxicity with minimal evidence of teratogenicity (2500 mg/m³). The no-effects concentration (based on maternal toxicity) was 500 mg/m³. In a further study in mice, no teratogenic effects could be produced when ethylene glycol was applied to skin of pregnant mice over the period of organogenesis. The above observations suggest that ethylene glycol is to be regarded as an animal teratogen. There is currently no available information to suggest that ethylene glycol has caused birth defects in humans. Cutaneous application of ethylene glycol is ineffective in producing developmental toxicity. Exposure to high aerosol concentrations is only minimally effective in producing developmental toxicity. The major route for producing developmental toxicity is perorally.

Two chronic feeding studies, using rats and mice, have not produced any evidence that ethylene glycol causes dose-related increases in tumor incidence, or a different pattern of tumors compared with untreated controls. The absence of a carcinogenic potential for ethylene glycol has been supported by numerous in vitro genotoxicity studies showing that it does not produce mutagenic or clastogenic effects.

Contains a small amount of antimony oxide. Long-term repeated inhalation exposure to antimony oxide has been shown to cause malignant tumors in the lungs of laboratory rats. Antimony oxide is classified by IARC as possibly carcinogenic to humans.

OTHER EFFECTS OF OVEREXPOSURE:

Repeated skin contact with ethylene glycol may, in a very small proportion of cases, cause sensitization with the development of allergic contact dermatitis. The incidence is significantly less than 1% with the undiluted material.

PRODUCT NAME: ETHYLENE GLYCOL BY-PRODUCT

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EMERGENCY AND FIRST AID PROCEDURES:

SWALLOWING:

If patient is fully conscious, give two glasses of water. Induce vomiting. Obtain medical attention without delay. If medical advice is delayed, and if the person has swallowed a moderate volume of material (a few ounces), then give three to four ounces of hard liquor, such as whiskey. For children, give proportionally less liquor, according to weight.

SKIN:

Remove contaminated clothing. Wash skin with soap and water. If irritation persists or if contact has been prolonged, obtain medical attention.

INHALATION:

Remove to fresh air. Obtain medical attention if symptoms persist.

EYES:

Flush eyes thoroughly with water for several minutes.

NOTES TO PHYSICIAN:

It is estimated that the lethal oral dose of ethylene glycol to adults is of the order of 1.0 ml/kg. Ethylene glycol is metabolized by alcohol dehydrogenase to various metabolites including glycoaldehyde, glycolic acid, and oxalic acid, which cause an elevated anion-gap metabolic acidosis and renal tubular injury. The signs and symptoms in ethylene glycol poisoning are those of metabolic acidosis, CNS depression, and kidney injury. Urinalysis may show albuminuria, hematuria and oxaluria. Clinical chemistry may reveal anion-gap metabolic acidosis and uremia.

The currently recommended medical management of ethylene glycol poisoning includes elimination of ethylene glycol and metabolites, correction of metabolic acidosis, and prevention of kidney injury. It is essential to have immediate and follow-up urinalysis and clinical chemistry. There should be particular emphasis on acid-base balance and renal function tests. A continuous infusion of 5% sodium bicarbonate with frequent monitoring of electrolytes and fluid balance is used to achieve correction of metabolic acidosis and forced diuresis.

As a competitive substrate for alcohol dehydrogenase, ethanol is antidotal. Given in the early stages of intoxication, it blocks the formation of nephrotoxic metabolites. A therapeutically effective blood concentration of ethanol is in the range 100-150 mg/dl, and should be achieved by a rapid loading dose and maintained by intravenous infusion.

For severe and/or deteriorating cases, hemodialysis may be required. Dialysis should be considered for patients who are symptomatic, have severe metabolic acidosis, a blood ethylene glycol concentrations greater than 25 mg/dl, or compromise of renal functions.

4-Methylpyrazole, a potent inhibitor of alcohol dehydrogenases, has been effectively used to decrease the metabolic consequences of ethylene glycol poisoning before metabolic acidosis, coma, seizures, and renal failure have occurred.

Additional therapeutic measures may include the administration of cofactors involved in the metabolism of ethylene glycol. Thiamine (100 mg) and pyridoxine (50 mg) should be given every six hours.

Pulmonary edema with hypoxemia has been described in a number of patients following poisoning with ethylene glycol. The mechanism of production has not been elucidated, but it appears to be non-cardiogenic in origin in several cases. Respiratory support with mechanical ventilation and positive end-expiratory pressure may be required.

There may be cranial nerve involvement in the late stages of toxicity from swallowed ethylene glycol. In particular, effects have been reported involving the seventh, eighth and ninth cranial nerves, presenting with bilateral facial paralysis, diminished hearing, and dysphagia.

VI. REACTIVITY DATA

STABILITY: Stable

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PRODUCT NAME: ETHYLENE GLYCOL BY-PRODUCT

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CONDITIONS TO AVOID: None known.

INCOMPATIBILITY (materials to avoid):

Explosive decomposition may occur if combined with strong acids or strong bases and subjected to elevated temperatures. Therefore, avoid strong acids and strong bases at elevated temperatures. Avoid contamination with strong oxidizing agents and materials reactive with hydroxyl compounds.

HAZARDOUS COMBUSTION OR DECOMPOSITION PRODUCTS:

Burning can produce the following combustion products:
Carbon monoxide and/or carbon dioxide.

HAZARDOUS POLYMERIZATION: Will Not Occur

CONDITIONS TO AVOID: None known.

VII. SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:

Wear suitable protective equipment. Large spills should be contained and collected. Small spills can be collected or may be absorbed with appropriate liquid absorbing materials. All spill response and disposal should be carried out in accordance with Federal, State, and local requirements.

WASTE DISPOSAL METHOD:

Incinerate in a furnace where permitted under Federal, State, and local regulations.

VIII. SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (specify type):

If personnel exposure exceeds exposure limits 50 ppm (aerosol and vapor combined) at any time, select respiratory protection equipment in accordance with 29CFR 1910.134. NIOSH-approved atmosphere-supplying respirator or a NIOSH-approved air-purifying respirator with organic vapor cartridge and dust/mist pre-filter is recommended.

VENTILATION:

General (mechanical) room ventilation may be adequate, if handled at ambient temperatures or in covered equipment. If ambient temperatures are exceeded or operations exist which may produce misting, local exhaust ventilation or other engineering controls may be required.

PROTECTIVE GLOVES: PVC-coated
Rubber

EYE PROTECTION: Monogoggles or Faceshield

OTHER PROTECTIVE EQUIPMENT:
Eye Bath, Safety Shower

IX. SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:

⚠ DANGER: Harmful or fatal if swallowed.
Prolonged or repeated breathing of mist or vapor harmful.
Causes eye irritation.
May cause kidney and nervous system damage.

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PRODUCT NAME: ETHYLENE GLYCOL BY-PRODUCT

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Causes birth defects in laboratory animals.
Do not swallow.
Do not breathe mist from spray.
Avoid prolonged or repeated breathing of vapor.
Avoid contact with eyes.
Keep container closed.
Use with adequate ventilation.
Wash thoroughly after handling.

FOR INDUSTRY USE ONLY

OTHER PRECAUTIONS:

WARNING: Sudden release of hot organic chemical vapors or mists from process equipment operating at elevated temperature and pressure, or sudden ingress of air into vacuum equipment, may result in ignitions without the presence of obvious ignition sources. Published "autoignition" or "ignition" temperature values cannot be treated as safe operating temperatures in chemical processes without analysis of the actual process conditions.

Any use of this product in elevated-temperature processes should be thoroughly evaluated to establish and maintain safe operating conditions. Further information is available in a technical bulletin entitled "Ignition Hazards of Organic Chemical Vapors."

X. REGULATORY INFORMATION

STATUS ON SUBSTANCE LISTS:

The concentrations shown are maximum or ceiling levels (weight %) to be used for calculations for regulations.
Trade Secrets are indicated by "TS".

FEDERAL EPA

Comprehensive Environmental Response Compensation, and Liability Act of 1980 (CERCLA) requires notification of the National Response Center of release of quantities of Hazardous Substances equal to or greater than the reportable quantities (RQs) in 40 CFR 302.4.

Components present in this product at a level which could require reporting under the statute are:

CHEMICAL	CAS NUMBER	UPPER BOUND CONCENTRATION %
Dioxane	123-91-1	.0026
Ethylene Oxide	75-21-8	.0001
Antimony Salts	--	0.1
Ethylene Glycol	107-21-1	95.0

Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III

requires emergency planning based on Threshold Planning Quantities (TPQs) and release reporting based on Reportable Quantities (RQs) in 40 CFR 355 (used for SARA 02, 304, 311 and 312).

Components present in this product at a level which could require reporting under the statute are:

NONE

Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III

requires submission of annual reports of release of toxic chemicals that appear in 40 CFR 372 (for SARA 313). This information must be included in all MSDSs that are copied and distributed for this material.

Components present in this product at a level which could require reporting under the statute are:

CHEMICAL	CAS NUMBER	UPPER BOUND CONCENTRATION %
Ethylene Glycol	107-21-1	95.0
Terephthalic Acid	100-21-0	2.0
Antimony Salts	--	0.1

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PRODUCT NAME: ETHYLENE GLYCOL BY-PRODUCT

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Toxic Substances Control Act (TSCA) STATUS:

The ingredients of this product are on the TSCA inventory.

STATE RIGHT-TO-KNOW

CALIFORNIA Proposition 65

This product contains trace levels of ACETALDEHYDE AND DIOXANE which the State of California has found to cause cancer, birth defects or other reproductive harm.

MASSACHUSETTS Right-To-Know, Substance List (MSL) Hazardous Substances and Extraordinarily Hazardous Substances on the MSL must be identified when present in products.

Components present in this product at a level which could require reporting under the statute are:

EXTRAORDINARILY HAZARDOUS SUBSTANCES ($\geq 0.0001\%$)

CHEMICAL	CAS NUMBER	UPPER BOUND CONCENTRATION %
Dioxane	123-91-1	.0026
Methanol	67-56-1	.0024
Antimony Salts	--	0.1

HAZARDOUS SUBSTANCES ($\geq 1\%$)

CHEMICAL	CAS NUMBER	UPPER BOUND CONCENTRATION %
Ethylene Glycol	107-21-1	95.0

PENNSYLVANIA Right-to-Know, Hazardous Substance List Hazardous Substances and Special Hazardous Substances on the List must be identified when present in products.

Components present in this product at a level which could require reporting under the statute are:

HAZARDOUS SUBSTANCES ($\geq 1\%$)

CHEMICAL	CAS NUMBER	UPPER BOUND CONCENTRATION %
Ethylene Glycol	107-21-1	95.0
Diethylene Glycol	111-46-6	2.0
Antimony Salts	--	0.1

CALIFORNIA SCAQMD RULE 443.1 VOC'S:

Not presently available

NOTE ---

The opinion expressed herein are those of qualified experts within Union Carbide. We believe that the information contained herein is current as of the date of this Material Safety Data Sheet. Since the use of this information and the conditions of the use of the product are not under the control of Union Carbide, it is the user's obligation to determine conditions of safe use of the product.

REVISED SECTIONS:

The format of this MSDS has been altered slightly. In addition, the text of several statements have been changed to enhance consistency among products with similar characteristics. Please review the entire MSDS to insure safe handling and use of this material.

PC: 36535
F NUMBER: N0351B

HER 03340

IN CASE OF EMERGENCY: CALL 1-800-424-9300
EMERGENCY RESPONSE INFORMATION SHEET

DOT

FLAMMABLE
LIQUID

C-5 CUT

(CYCLOPENTADIENE CRUDE)

COMPOSITION: ISOPRENE 8-20%; CYCLOPENTADIENE 1-20%; DICYCLOPENTADIENE 3-22% C5 MIXTURE
FORM: LIQUID
DENSITY: 0.71
SOLUBILITY IN WATER: SLIGHT
BOILING POINT: 29°F
FLASH POINT: <-20°F (TCC)
FLAMMABLE LIMITS: 1-9% VOL. %
VAPOR HAZARD: FLAMMABLE
REACTS WITH: CATALYSTS, EG., IRON OXIDE OR FERRIC CHLORIDE. MAY POLYMERIZE WITH RELEASE OF HEAT AT TEMPERATURES OVER 150°F.

HAZARDS

ENVIRONMENT: ANIMAL: AVOID EXPOSURE.
FISH: PREVENT ENTRY INTO NATURAL WATERS.
EXPOSURE: EYES: BOTH LIQUID AND VAPOR MAY CAUSE IRRITATION, CORNEAL INJURY LIKELY.
SKIN: UP TO MODERATE IRRITATION OR BURN IF CONFINED.
INHALATION: VAPORS MAY BE IRRITATING. HIGH CONCENTRATION MAY CAUSE UNCONSCIOUSNESS.
INGESTION: MODERATELY TOXIC.

IN CASE OF ACCIDENT

SPILL
OR
LEAK

FLAMMABLE. KEEP UPWIND. ISOLATE AND SHUT OFF AREA.
AVOID EYE AND SKIN CONTACT. DO NOT BREATHE VAPORS. NO SMOKING, FLARES OR OPEN FLAMES. SHUT OFF IGNITION AND LEAK IF WITHOUT RISK.
SPILLS/LEAKS: PREVENT IGNITION. PREVENT ENTRY INTO SEWERS OR NATURAL WATERS. USE NONCOMBUSTIBLE ABSORBENT OR SAND AND SWEEP OR SCOOP INTO SUITABLE CONTAINERS.
CLOTHING: WEAR PROTECTIVE CLOTHING INCLUDING RUBBER GLOVES AND SELF-CONTAINED BREATHING APPARATUS.
DISPOSAL: CONTACT MANUFACTURER AND AUTHORITIES.

FIRE

FLAMMABLE. DO NOT PUT OUT FIRES AT VENTS OR OTHER FIRES UNTIL LEAK HAS BEEN SHUT OFF.
SMALL FIRES: USE DRY CHEMICAL, CARBON DIOXIDE, OR WATER SPRAY/FOG.
LARGE FIRES: USE WATER FOG OR SPRAY OR FOAM. IF FIRE MASSIVE OR ADVANCE EVACUATE. USE MONITOR NOZZLES AND EVACUATE OR FIGHT FROM A PROTECTED POSITION. USE MONITOR NOZZLES AND HOSE STREAMS TO COOL CONTAINERS EXPOSED TO FIRES WHILE EVACUATING OR IF DECISION IS TO FIGHT FIRE.
DO NOT ALLOW ENTRY INTO SEWERS OR NATURAL WATERS.
CLOTHING: WEAR FIRE PROTECTIVE CLOTHING & SELF-CONTAINED BREATHING APPARATUS.

FIRST
AID

EYES: IRRIGATION IMMEDIATELY WITH WATER FOR 5 MINUTES IS GOOD SAFETY PRACTICE.
SKIN: IMMEDIATELY FLUSH WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES WHILE REMOVING CONTAMINATED CLOTHING. CALL A PHYSICIAN.
CLOTHING: REMOVE CONTAMINATED CLOTHING IMMEDIATELY, PREFERABLY UNDER SHOWER, AND WASH BEFORE REUSE. DESTROY CONTAMINATED SHOES.
INHALATION: REMOVE TO FRESH AIR IF EFFECTS OCCUR. CALL A PHYSICIAN AND/OR TAKE TO A MEDICAL FACILITY. IF RESPIRATION STOPS, GIVE MOUTH-TO-MOUTH RESUSCITATION.

The information contained herein is hereby presented as a complimentary act, in good faith, and is, to the best of The Dow Chemical Company's knowledge and belief, accurate and reliable as of the date printed, but may well be incomplete. No representation, guarantee or warranty is made as to its accuracy, reliability or completeness and, as Governmental regulations and use conditions may change, it is the user's responsibility to determine the current appropriate uses and suitability for specific and uses prior to use.

12-01-78



TRANSPORTATION EQUIPMENT DATA

- EMERGENCY DATA
ON OTHER SIDE -

PRODUCT		C-5 CUT	CODE NO.	13495	DATE ISSUED OR REVISED	R-12-01-78
SYNOPSIS:			TYPE COMMODITY			
Crude Cyclopentadiene			Petroleum Fuel Oil Distillate			
CHARACTERISTICS	DOT SHIPPING NAME		DOT HAZARD CLASS			
	FLAMMABLE LIQUID NOS		FLAMMABLE LIQUID			
	FLASH POINT	FLAMMABLE LIMITS	BOILING POINT	VAPOR DENSITY (AIR = 1)		
	<20°F (TCC)	1 - 9%	29°F	> air		
	FREEZING POINT	LOADING TEMP.	MAX. PRODUCT TEMP.	MAX. STEAM PRESSURE		
	--	<100°F	--	--		
	WT/GAL @ 15.7° (50° C)	CONCENTRATION SHIPPED	SOLUBILITY IN WATER	PHYSICAL STATE		
5.9 lbs	100%	Slight	Liquid			

APPROVED EQUIPMENT:

TANK TRUCK		TANK CAR
TANK TYPE:	MC 303, 304, 305, 306, 307	DOT 111A100W1, 105A100W, 112A140W
TANK MATERIALS:	Stainless steel, Aluminum, Lined steel	Carbon steel
INSULATION:	Not required	Not required
STEAMCOILS:	Not required	Not required
METHOD USED TO CLEAN TANK:	Drain, rinse, steam, rinse and dry.	Drain, rinse, steam, rinse and dry. (Boil with 10% caustic soda solution if necessary)
PUMP TYPES:	Carbon steel, stainless steel Centrifugal or positive displacement	
HOSE TYPES:	Seamless stainless steel, Seamless bronze, cross-linked P/P	
GASKETS:	Asbestos, Teflon	
OTHER:		

HANDLING:

HOW UNLOADED:	Pump or inert gas pressure (Pressure not approved for MC 303 & 306 tanks)
PROBLEMS:	FLAMMABLE. PREVENT IGNITION. GROUND EQUIPMENT. NO SMOKING OR OPEN FLAMES. LIQUID AND VAPOR MAY CAUSE IRRITATION. AVOID PERSONAL CONTACT. DO NOT BREATHE VAPORS.
PRECAUTIONS:	USE PROTECTIVE EQUIPMENT--MINIMUM OF CHEMICAL WORKERS GOGGLES, HARD HAT, RUBBER GLOVES AND RUBBER BOOTS. HAVE RESPIRATOR AVAILABLE.
OTHER:	

HER 03342

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**UNION CARBIDE CHEMICALS AND PLASTICS COMPANY INC.**

Industrial Chemicals Division

**MATERIAL SAFETY DATA SHEET
FOR INTERMEDIATE**

Union Carbide urges each customer or recipient of this MSDS to study it carefully to become aware of and understand the hazards associated with the product. The reader should consider consulting reference works or individuals who are experts in ventilation, toxicology, and fire prevention, as necessary or appropriate to use and understand the data contained in this MSDS.

To promote safe handling, each customer or recipient should: (1) notify its employees, agents, contractors and others whom it knows or believes will use this material or the information in this MSDS and any other information regarding hazards or safety; (2) furnish this same information to each of its customers for the product; and (3) request its customers to notify their employees, customers, and other users of the product of this information.

EFFECTIVE DATE: 10/08/92**OBSOLETE DATE:** 10/08/95**I. IDENTIFICATION**

PRODUCT NAME:	NAPHTHA
CHEMICAL NAME:	Naphtha
CHEMICAL FAMILY:	Hydrocarbons
FORMULA:	Not Applicable
MOLECULAR WEIGHT:	Not Applicable
SYNONYMS:	Gasoline, Petroleum Naphtha
CAS # AND NAME:	8030-30-6 Naphtha

II. PHYSICAL DATA (Determined on Typical Material)

BOILING POINT, 760 mm Hg:	21°C TO -191°C (70°F TO -425°F)
SPECIFIC GRAVITY(H₂O = 1):	0.654 TO 0.739 AT 15/4°C
FREEZING POINT:	<-20°C (-4°F)
VAPOR PRESSURE AT 20°C:	<12 PSIA
VAPOR DENSITY (AIR = 1):	<1
EVAPORATION RATE (Butyl Acetate = 1):	<1
SOLUBILITY IN WATER by wt:	insoluble

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EMERGENCY PHONE NUMBERS: 1-800-UCC-HELP (NUMBER AVAILABLE AT ALL TIMES) OR (204) 744-3487

UNION CARBIDE CHEMICALS AND PLASTICS COMPANY INC
Industrial Chemicals Division
39 Old Kidgobury Road, Danbury, CT 06817-0001

HER 03343

PRODUCT NAME: NAPHTHA

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APPEARANCE: Yellow

ODOR: Hydrocarbon

PHYSICAL STATE: Liquid

III. INGREDIENTS

%	MATERIAL	CAS#	EXPOSURE LIMIT
0.6-1.1	n-Hexane	110-54-3	50 ppm-TWAB, ACGIH, OSHA
0.15-5.65	Benzene	71-43-2	0.1 ppm TWAB (skin), ACGIH 1 ppm TWAB, OSHA 5 ppm STEL, OSHA
0.36-2.95	Toluene	108-88-3	50 ppm TWAB (skin), ACGIH 100 ppm TWAB, OSHA 150 ppm STEL, OSHA
0.3-1.2	Xylenes	1330-20-7	100 ppm TWAB, 150 ppm STEL; OSHA & ACGIH
0-4.7	Cyclohexane	110-82-7	300 ppm-TWAB, ACGIH, OSHA
<100	Naphtha	8030-30-6	100ppm TWA, 100ppm PEL, OSHA

IV. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (test method(s)): 20°F
Pensky-Martens Closed Cup ASTM D 93

FLAMMABLE LIMITS IN AIR
% by volume: LOWER: 1.1
UPPER: Approx. 5.9

SPECIAL FIRE FIGHTING PROCEDURES:
Use water spray to cool fire-exposed containers and structures.
Use water spray to disperse vapors; re-ignition is possible.
Use protective clothing, eye protection and have self-contained breathing apparatus available.

EXTINGUISHING MEDIA: Apply alcohol-type or all-purpose-type foam by manufacturer's recommended techniques for large fires. Use carbon dioxide or dry chemical media for small fires.

UNUSUAL FIRE AND EXPLOSION HAZARDS:
Vapors form from this product and may travel or be moved by air currents and ignited by pilot lights, other flames, smoking, sparks, heaters, electrical equipment, static discharges or other ignition sources at locations distant from product handling point.
Vapors from this material may settle in low or confined areas or travel a long distance to an ignition source and flash back explosively.

HER 03344

PRODUCT NAME: NAPHTHA

PAGE 3

This material may produce a floating fire hazard in extreme fire conditions.

V. HEALTH HAZARD DATA

EXPOSURE LIMIT(S): See Section III.

EFFECTS OF SINGLE OVEREXPOSURE:

SWALLOWING: Aspiration into the lungs may occur during ingestion or vomiting, resulting in lung injury. Abdominal discomfort, nausea and vomiting may occur.

SKIN ABSORPTION: Prolonged or widespread contact may result in the absorption of potentially harmful amounts of material.

INHALATION: Causes irritation of the respiratory tract, experienced as nasal discomfort and discharge, with chest pain, coughing, headache, nausea, vomiting, dizziness, drowsiness, disturbed vision and unconsciousness. Liver and kidney damage may occur. Blood damage may occur. Depression of bone marrow activity may occur.

SKIN CONTACT: Causes irritation with discomfort and local redness. Prolonged or repeated contact may cause dermatitis and drying of the skin.

EYE CONTACT: Excess redness of the conjunctiva may occur. May cause irritation, experienced as stinging with excess blinking and tear production.

EFFECTS OF REPEATED OVEREXPOSURE:

Prolonged exposure can cause dizziness, weakness, weight loss, anemia, a feeling of agitation, plus pain, numbness, and a tingling sensation in the limbs. The red blood cell count may be reduced, bone marrow may be hypoplastic, and hematuria may be found. Skin irritation can occur.

MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE:

Skin contact may aggravate an existing dermatitis. Inhalation of material may aggravate asthma and inflammatory or fibrotic pulmonary disease.

SIGNIFICANT LABORATORY DATA WITH POSSIBLE RELEVANCE TO HUMAN HEALTH HAZARD EVALUATION:

None currently known.

OTHER EFFECTS OF OVEREXPOSURE:

Contains benzene, a known human carcinogen. May cause various blood disorders, including anemia and leukemia. Effects of chronic exposure may be delayed. Benzene is included in the IARC, NTP, and OSHA lists of carcinogens.

EMERGENCY AND FIRST AID PROCEDURES:

SWALLOWING: DO NOT INDUCE VOMITING. Do not give anything to drink. Obtain medical attention without delay.

SKIN: Remove contaminated clothing. Wash skin with soap and water. Obtain medical attention if irritation persists. Wash clothing before reuse.

HER 03345

PRODUCT NAME: NAPHTHA

PAGE 4

INHALATION:

Remove to fresh air. Give artificial respiration if not breathing. If breathing is difficult, oxygen may be given by qualified personnel. Obtain medical attention urgently. If exposure is severe, hospitalize and observe. Treatment for pulmonary edema and hemorrhage may be required.

EYES:

Immediately flush eyes with water and continue washing for at least 15 minutes. Obtain medical attention without delay, preferably from an ophthalmologist.

NOTES TO PHYSICIAN:

A component of this material may be a cardiac sensitizer. Avoid the use of epinephrine.

VI. REACTIVITY DATA

STABILITY: Stable

CONDITIONS TO AVOID:

Contact with excessive heat, open flame, sparks, or ignition sources.

INCOMPATIBILITY (materials to avoid):

Strong oxidizing agents.
Avoid halogens (chlorine) in the presence of sunlight or ultraviolet light.

HAZARDOUS COMBUSTION OR DECOMPOSITION PRODUCTS:

Burning can produce the following combustion products:
Carbon monoxide and/or carbon dioxide.

HAZARDOUS POLYMERIZATION: Will Not Occur

CONDITIONS TO AVOID:

None known.

VII. SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:

Eliminate all sources of ignition in vicinity of spill or released vapor. Clean up spills as soon as possible, observing precautions in Section Protective Information. Absorb small spills with absorbent clay, diatomaceous earth, or other suitable material. A fire or vapor hazard may exist since these cleanup materials will only absorb liquid; they will not absorb vapor. Large spills should be collected for disposal. Avoid runoff; See Section IX.

WASTE DISPOSAL METHOD:

Prevent contamination of surrounding environment. Incinerate waste in an approved combustion device or flare in accordance with Federal, State and local regulations.

VIII. SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (specify type):

Select in accordance with 29CFR1910.134. Supplied air or self-contained breathing apparatus recommended if personnel exposure exceeds exposure limits.

VENTILATION:

General (mechanical) room ventilation is expected to be satisfactory where this product is stored and handled in closed equipment. Special, local ventilation is needed at points where vapors can be expected to escape to the workplace air.

HER 03346

PRODUCT NAME: NAPHTHA

PAGE 5

PROTECTIVE GLOVES: Polyvinyl alcohol
'Viton'

EYE PROTECTION: Monogoggles or Faceshield

OTHER PROTECTIVE EQUIPMENT:
Eye bath, safety shower, and chemical apron.

IX. SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:

DANGER: Extremely flammable.
Harmful if inhaled.
Causes eye and skin irritation.
May cause kidney, liver and red blood cell damage.
Aspiration may cause lung damage.
May cause nervous system damage.
Contains Benzene - a cancer hazard.
Keep away from heat, sparks and flame.
Avoid breathing vapor.
Avoid contact with eyes, skin and clothing.
Do not swallow.
Keep container closed.
Use with adequate ventilation.
Vapors from this product and may travel or be moved by air currents and ignited by pilot lights, other flames, smoking sparks, heaters, electrical equipment, static discharges or other ignition sources at locations distant from product handling point.
Wash thoroughly after handling.

OTHER PRECAUTIONS:

SPILLS - This product is insoluble in water and will float on the surface. It could cause a fire or explosion in a sewer and could spread a floating fire. Avoid discharge to sewers or waterways.

WARNING: Sudden release of hot organic chemical vapors or mists from process equipment operating at elevated temperature and pressure, or sudden ingress of air into vacuum equipment, may result in ignitions without the presence of obvious ignition sources. Published "autoignition" or "ignition" temperature values cannot be treated as safe operating temperatures in chemical processes without analysis of the actual process conditions.

Any use of this product in elevated-temperature processes should be thoroughly evaluated to establish and maintain safe operating conditions. Further information is available in a technical bulletin entitled "Ignition Hazards of Organic Chemical Vapors."

X. REGULATORY INFORMATION

STATUS ON SUBSTANCE LISTS:

The concentrations shown are maximum or ceiling levels (weight %) to be used for calculations for regulations.
Trade Secrets are indicated by "TS".

FEDERAL EPA

Comprehensive Environmental Response Compensation, and Liability Act of 1980 (CERCLA) requires notification of the National Response Center of release of quantities of Hazardous Substances equal to or greater than the reportable quantities (RQs) in 40 CFR 302.4.

Components present in this product at a level which could require reporting under the statute are:

HER 03347

PRODUCT NAME: NAPHTHA

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CHEMICAL	CAS NUMBER	UPPER BOUND CONCENTRATION %
Benzene	71-43-2	6.65
Toluene	108-88-3	2.95
Xylenes	1330-20-7	1.20
Cyclohexane	110-82-7	4.7

Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III requires emergency planning based on Threshold Planning Quantities (TPQs) and release reporting based on Reportable Quantities (RQs) in 40 CFR 355 (used for SARA 302, 304, 311 and 312).

Components present in this product at a level which could require reporting under the statute are:
NONE

Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III requires submission of annual reports of release of toxic chemicals that appear in 40 CFR 372 (for SARA 311-313). This information must be included in all MSDSs that are copied and distributed for this material.

Components present in this product at a level which could require reporting under the statute are:

CHEMICAL	CAS NUMBER	UPPER BOUND CONCENTRATION %
Benzene	71-43-2	6.65
Toluene	108-88-3	2.95
Xylenes	1330-20-7	1.20
Cyclohexane	110-82-7	4.7

Toxic Substances Control Act (TSCA) STATUS:

The ingredients of this product are on the TSCA inventory.

STATE RIGHT-TO-KNOW

CALIFORNIA Proposition 65

This product contains BENZENE which the State of California has found to cause cancer, birth defects or other reproductive harm.

MASSACHUSETTS Right-To-Know, Substance List (MSL) Hazardous Substances and Extraordinary Hazardous Substances on the MSL must be identified when present in products.

Components present in this product at a level which could require reporting under the statute are:

HAZARDOUS SUBSTANCES ($\geq 1\%$)

CHEMICAL	CAS NUMBER	UPPER BOUND CONCENTRATION %
*** None Known ***		

PENNSYLVANIA Right-to-Know, Hazardous Substance List Hazardous Substances and Special Hazardous Substances on the List must be identified when present in products.

Components present in this product at a level which could require reporting under the statute are:

HAZARDOUS SUBSTANCES ($\geq 1\%$)

CHEMICAL	CAS NUMBER	UPPER BOUND CONCENTRATION %
*** None Known ***		

CALIFORNIA SCAQMD RULE 443.1 VOC'S:

Not presently available

HER 03348

PRODUCT NAME: NAPHTHA

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NOTE ----

The opinions expressed herein are those of qualified experts within Union Carbide. We believe that the information contained herein is current as of the date of this Material Safety Data Sheet. Use this intermediate only in accordance with applicable local standard operating procedures.

REVISED SECTIONS:

The format of this MSDS has been altered slightly. In addition, the text of several statements have been changed to enhance consistency among products with similar characteristics. Please review the entire MSDS to insure safe handling and use of this material.

PC: 62913
F NUMBER: N07550

HER 03349

ETHYL BUTANOL

Synonyms—2-Ethylbutanol; 2-Ethyl-1-butanol; 2-Ethyl butyl alcohol; sec-Hexyl alcohol; sec-Pentylcarbinol; Pseudohexyl alcohol

United Nations Number..... 2275

CHRIS Code..... EBT

Formula— $\text{CH}_3\text{CH}_2\text{CH}(\text{C}_2\text{H}_5)\text{CH}_2\text{OH}$

Appearance—Colorless liquid; mild odor

Boiling Point..... 146°C 293°F

Freezing Point..... -114°C -173°F

Specific Gravity—0.83

Vapor Pressure 20°C (68°F) (mmHg)..... 0.9

Reid Vapor Pressure (psia)..... 1.07

Vapor Pressure 46°C (115°F) (psia)..... 0.14

Vapor Density (Air = 1.0)..... 3.4

Chemical Family—Alcohols

Solubility in Water..... Slight

Pollution Category—USEPA IMO @0
Applicable Bulk Reg. 46 CFR Subchapter 0

FIRE & EXPLOSION HAZARD DATA

Grade—D: Combustible liquid
Electrical Group—D

General—Moderate fire hazard when exposed to heat or flame.

Flash Point (°F)..... 137

Flammable Limits..... 1.9 to 8.8%

Autoignition Temp. (°F)..... 560 (calculated)

Extinguishing Agents..... Water spray, dry chemical, foam or CO_2 .

Special Fire Procedures..... Cool exposed tanks with water. If a leak or spill has not ignited, use water spray to disperse vapors.

HEALTH HAZARD DATA

Health Hazard Ratings
1, 2, 0

Odor Threshold (ppm)
Unavailable

PEL/TWA (ppm)
Unavailable

TLV/TWA (ppm)
Unavailable

General—Low toxicity.

Symptoms—Animals tests show minor skin irritation after 24 hours. Severe surface damage of eye when alcohol in sufficient concentration. No deaths upon ingestion.

Short Exposure Tolerance—Unavailable

Exposure Procedures—Vapor—remove victim to fresh air; if breathing stops, apply artificial respiration. Eye and skin contact—gently flush affected areas with water for 15 minutes. Get medical attention.

REACTIVITY DATA

Stability—Stable.

Compatibility—Material: Usual materials of construction are suitable.

Charge: Group 20 of compatibility chart.

SPILL OR LEAK PROCEDURE

Secure ignition sources. Wear rubber gloves, face shield, protective clothing. Have all-purpose canister mask available.

If a spill occurs, call the National Response Center, 800-424-8802.

HER 03350

DIETHYLENE GLYCOL

Synonyms—DEG; Diglycol; Dihydroxyethyl ether;
2,2'-Dihydroxyethyl ether; bis(2-hydroxyethyl)ether;
3-Oxa-1,6-pentanediol; 2,2'-Oxybisethanol;
2,2'-Oxydiethanol

United Nations Number..... 1

CHRIS Code..... DEG

Formula— $(CH_2CH_2OH)_2O$

Boiling Point..... 245°C 472°F
..... °C °F

Appearance-Odor—Colorless, syrupy liquid; slight odor

Freezing Point..... -6°C 21°F
..... °C °F

Specific Gravity—1.12

Vapor Pressure 20°C (68°F) (mmHg)..... V. Low

Chemical Family—Glycol ethers

Acid Vapor Pressure (psia)..... V. Low

Vapor Pressure 46°C (115°F) (psia)..... V. Low

Pollution Category—USEPA III

Vapor Density (Air = 1.0)..... 2.00

Applicable Bulk Reg. 46 CFR Subchapter..... D

Solubility in Water..... Completely

FIRE & EXPLOSION HAZARD DATA

Grade—E: Combustible liquid
Electrical Group—C

General—Slight hazard, when exposed to heat or flame; can react with oxidizing materials.

Flash Point (°F)..... 255
Flammable Limits..... 1.8 to 10.8%
Autoignition Temp. (°F)..... 444
Extinguishing Agents..... CO₂, dry chemical, alcohol foam, water spray
Special Fire Procedures..... Water or foam may cause frothing. Do not direct water directly into fire.

HEALTH HAZARD DATA

Health Hazard Ratings	Odor Threshold (ppm)	PEL/TWA (ppm)	TLV/TWA (ppm)
<u>0, 1</u>	<u>Unavailable</u>	<u>Unavailable</u>	<u>Unavailable</u>

General—Under ordinary conditions of handling, not considered toxic.

Symptoms—Skin which has come into contact with the liquid may burn or itch.

Short Exposure Tolerance—Unavailable.

Exposure Procedures—Eye or skin contact—flush affected area gently with water for 15 minutes. For eye contact, or if skin is blistered or peeled, get medical attention.

REACTIVITY DATA

Stability—Stable.

Compatibility—Material: Compatible with most materials of construction.

Cargo: Group 40 of compatibility chart.

SPILL OR LEAK PROCEDURE

Wear rubber gloves, face-shield, protective clothing. Avoid contact with liquid.

If a spill occurs, call the National Response Center, 800-424-8802.

HER 03351

BENZENE

Synonyms—Benzol; Benzole; Coal naphtha; Coal tar naphtha; Cyclohexatriene; Phene; Phenyl hydruu

United Nations Number..... 1114

Formula— C_6H_6

CHRIS Code..... BNZ

Appearance—O or—Clear colorless liquid with a typical, pleasant aromatic odor
Specific Gravity—0.88

Boiling Point..... 80°C 178°F
Freezing Point..... 6°C 42°F

Chemical Family—Aromatic hydrocarbon

Vapor Pressure 20°C (68°F) (mmHg)..... 75
Reid Vapor Pressure (psia)..... 3.22
Vapor Pressure 46°C (115°F) (psia)..... 4.5
Vapor Density (Air = 1.0)..... 2.8
Solubility in Water..... Negligible

Pollution Category—USEPA A IMO C
Applicable Bulk Reg. 46 CFR Subchapter D

FIRE & EXPLOSION HAZARD DATA

Grade—C: Flammable liquid.
Electrical Group—D

General—Extremely flammable. Ignited by heat, sparks, open flame. Flashback along vapor trail may occur. Vapor may explode if ignited in an enclosed area. Precautions must be taken to prevent static electricity buildup.

Flash Point (°F)..... 12 (Benzene is solid at 12°F)

Flammable Limits..... 1.4 to 8.0%

Autoignition Temp. (°F)..... 1076

Extinguishing Agents..... CO_2 , dry chemical, foam, water fog

Special Fire Procedures..... Water may be ineffective on a fire. Fire parties must wear respiratory protection and rubber boots. In other respects, fight like a gasoline fire. Explosion hazard is great if ignition has not already occurred and hence civil defense authorities should also be alerted. Cool exposed tanks with water.

HEALTH HAZARD DATA

Health Hazard Ratings 1, 1, 3	Odor Threshold (ppm) 4.68	PEL/TWA (ppm) 28 CFR 1910.1028	TLV/TWA (ppm) 10
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General—Benzene is a known carcinogen. Benzene vapors are severely toxic by inhalation. Benzene has a pleasant odor and narcotic effect and thus has poor warning properties.

Symptoms—Dizziness, headache, and drowsiness.

Short Exposure Tolerances—Vapor concentrations: 3000 ppm is endurable for 30–60 minutes (single exposure); 7500 ppm is dangerous in 30–60 minutes (single exposure); 20,000 ppm has been fatal in 5–10 minutes.

Exposure Procedures—Vapor—remove victim to fresh air; if breathing is difficult, administer oxygen. If breathing stops, apply artificial respiration. Skin or eye contact—remove contaminated clothing and gently flush affected areas with water for 15 minutes. Get medical help.

REACTIVITY DATA

Stability—Stable under normal conditions.

Compatibility—Material: Rubber on prolonged exposure to benzene first swells, then softens.

Cargo: Group 32 of compatibility chart.

SPILL OR LEAK PROCEDURE

Wear rubber gloves, face shield, plastic coated clothing. Wear self-contained breathing apparatus. Approach from upwind side. Avoid contact with liquid. Secure ignition sources. Small spills may be flushed away with water.

If a spill occurs, call the National Response Center, 800-424-8802.

HER 03352

CARGO INFORMATION CARD

1,1,1-TRICHLOROETHANE (Tri-Ethane)

UN2831

Clear, colorless liquid; ether-like odor

CAS #77-556

CARGO TRANSFER - Use authorized personnel only, properly protected.

WARNING! VAPOR HARMFUL

HANDLING AND STORAGE

- Do not use in poorly ventilated or confined areas.
- Vapors are heavier than air and will collect in low areas.
- Keep container closed when not in use.
- Store only in closed, properly labeled containers.
- Liquid oxygen or other strong oxidants may form explosive mixtures with 1,1,1-Trichloroethane.
- This material or its vapors when in contact with flames, hot glowing surfaces, or electric arcs can decompose to form hydrogen chloride gas and traces of phosgene.
- AVOID CONTAMINATION OF WATER SUPPLIES. Handling, storage, and use procedures must be carefully monitored to avoid leaks or spills. Any spill or leak has the potential to cause underground water contamination which may, if sufficiently severe, render a drinking water source unfit for human consumption. Contamination that does occur cannot be easily corrected.
- A chlorinated solvent used as a flashpoint suppressant must be added in sufficient quantity or the resultant mixture may have a flashpoint lower than the flammable component.
- Caution should be taken not to use in pressurized or totally enclosed system of aluminum construction. Example, paint or adhesive spray system.
- For additional product information, contact PPG Industries, Inc.

PRECAUTIONS

- **DO NOT BREATHE VAPORS:** High vapor concentrations can cause dizziness, unconsciousness or death. Long-term overexposure may cause possible central nervous system damage.
- **USE ONLY WITH ADEQUATE VENTILATION:** Ventilation must be sufficient to limit employee overexposure to 1,1,1-Trichloroethane in work area at or below permissible exposure limits. OSHA: 350 ppm, 8-hour TWA, (Time Weighted Average); 450 ppm, 15-minute STEL (Short Term Exposure Limit). Eye irritation, dizziness and/or drunkenness are signs of overexposure.
- **AVOID CONTACT WITH EYES:** Will cause irritation and pain.
- **AVOID PROLONGED OR REPEATED CONTACT WITH SKIN:** May cause irritation or dermatitis.
- **DO NOT SWALLOW:** Swallowing may cause injury or death.
- **DO NOT EAT, DRINK OR SMOKE IN WORK AREAS.**

IN CASE OF ACCIDENT

IF THIS HAPPENS

DO THIS

EXPOSURE

- **INHALATION:** Remove to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. Call a physician.
- **EYE/SKIN CONTACT:** Immediately flush eyes and skin with plenty of water (soap and water for skin) for at least 15 minutes while removing contaminated clothing & shoes. If irritation occurs, consult a physician. Thoroughly clean contaminated clothing & shoes before reuse or discard.
- **SWALLOWING:** If conscious, drink large quantities of water. **DO NOT** induce vomiting. Take immediately to a hospital or physician. If unconscious, or in convulsions, take immediately to a hospital. **DO NOT** give anything by mouth to an unconscious person.

NOTES TO PHYSICIAN: NEVER administer adrenaline following 1,1,1-Trichloroethane overexposure. Increased sensitivity of the heart to adrenaline may be caused by overexposure to 1,1,1-Trichloroethane.

FIRE

For fires involving 1,1,1-Trichloroethane, fire fighting personnel should wear a pressure-demand, self-contained breathing apparatus for possible exposure to hydrogen chloride and possible traces of phosgene.

SPILL OR LEAK

Immediately evacuate the area and provide maximum ventilation. Unprotected personnel should move upwind of spill. Only personnel equipped with proper respiratory and skin/eye protection should be permitted in area. Take care to contain spill. Take precautions as necessary to prevent contamination of ground and surface waters. Recover spilled material on absorbents, such as sand or vermiculite, and sweep into closed containers for disposal. After all visible traces have been removed, including ignitable vapors, thoroughly wet vacuum the area. If area of spill is porous, remove as much contaminated earth and gravel, etc. as necessary and place in closed containers for disposal. Contaminated sand, vermiculite, or porous surface may be disposed of in an approved hazardous waste facility. Recovered liquids may be reprocessed or incinerated or must be treated in a permitted hazardous waste management facility.

EMERGENCY

Contact PPG Industries, Inc. Newark, WV (304) 843-1300.

HER 03353



PPG Industries, Inc.
One PPG Place
Pittsburgh, PA 15272

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Made in U.S.A.

L86H-990A

METHYLCHLOROFORM

1,1,1-Trichloroethane UN2831 RC
CAS #71558

WARNING! ■ KEEP AWAY FROM FOOD
■ VAPOR HARMFUL

PRECAUTIONS

- **DO NOT BREATHE VAPORS.** High vapor concentrations can cause dizziness, unconsciousness or death. Long-term overexposure may cause possible central nervous system damage.
- **USE ONLY WITH ADEQUATE VENTILATION.** Ventilation must be sufficient to limit employee exposure to Methylchloroform in work area at or below permissible exposure limits. OSHA: 350 ppm, 8-hour TWA (Time Weighted Average), 450 ppm, 15-minute STEL (Short-Term Exposure Limit). Eye irritation, dizziness and/or drunkenness are signs of overexposure.
- **AVOID CONTACT WITH EYES.** Will cause irritation and pain.
- **AVOID PROLONGED OR REPEATED CONTACT WITH SKIN.** May cause irritation or dermatitis.
- **DO NOT SWALLOW.** Swallowing may cause injury or death.
- **DO NOT EAT, DRINK OR SMOKE IN WORK AREAS.**

FIRST AID

- **INHALATION:** Remove to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. Call a physician.
- **EYE/SKIN CONTACT:** Immediately flush eyes and skin with plenty of water (soap and water for skin) for at least 15 minutes while removing contaminated clothing and shoes. If irritation occurs, consult a physician. Thoroughly clean contaminated clothing and shoes before reuse or discard.
- **SWALLOWING:** If conscious, drink large quantities of water. **DO NOT** induce vomiting. Take immediately to a hospital or physician. If unconscious, or in convulsions, take immediately to a hospital. **DO NOT** give anything by mouth to an unconscious person.

NOTE TO PHYSICIAN: NEVER administer adrenaline following Methylchloroform exposure. Increased sensitivity of the heart to adrenaline may be caused by overexposure to Methylchloroform.

WARNING - Contains methyl chloroform a substance which harms public health and the environment by destroying ozone in the upper atmosphere.



PPG Industries, Inc.
One PPG Place
Pittsburgh, PA 15272

L26D-493G

See Reverse Side For Handling and Storage

NOTE: READ AND REMOVE TAG BEFORE UNLOADING

HER 03354

FOR CHEMICAL EMERGENCY - CALL 1-800-424-9300 IN THE U.S.A.
(1-202-483-7616 OUTSIDE THE CONTINENTAL U.S. AND IN WASHINGTON, D.C.)

EMERGENCY RESPONSE INFORMATION SHEET

PERCHLOROETHYLENE (VARIOUS GRADES)
(DS, PG, INDUSTRIAL & SVG GRADES)

DOT ORM-A
UN1897

PERCHLOROETHYLENE

FORM: LIQUID
SPECIFIC GRAVITY: 1.620 @ 25/25°F
SOLUBILITY IN WATER: DOES NOT MIX.
FREEZING POINT: -8°F
BOILING POINT: 250°F (APPROX.)

FLASH POINT: NONE
FLAMMABLE LIMITS: NONE
VAPOR HAZARD: MODERATELY IRRITATING.
REACTS WITH: MAGNESIUM, SODIUM
STRONG OXIDIZERS. WHEN HEATED,
EMITS HYDROGEN CHLORIDE AND
SODIUM CHLORIDE AND CHLORINE GAS.

HEALTH HAZARDS

ANIMAL: AVOID INGESTION AND EXPOSURE.
FISH: TOXIC. PREVENT ENTRY INTO NATURAL WATERS. WILL CAUSE FISH KILL.
EYES: PAIN. SLIGHT IRRITATION.
SKIN: SEVERE IRRITATION IF CONFINED. DEFATS THE SKIN.
INHALATION: MODERATELY IRRITATING. DROWSINESS, NAUSEA, INTERNAL INJURY.
INGESTION: LOW TOXICITY.

IN CASE OF ACCIDENT

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IRRITATING. KEEP UPWIND. ISOLATE AREA AND DENY ENTRY. AVOID CONTACT WITH EYES, SKIN AND CLOTHING. AVOID BREATHING VAPORS. STOP LEAK IF WITHOUT RISK. USE NONCOMBUSTIBLE ABSORBENT MATERIAL/SAND AND SHOVEL INTO SUITABLE CONTAINERS. DIKE LARGER SPILLS AND RECOVER. PREVENT ENTRY INTO SEWERS AND/OR NATURAL WATERS.
CLOTHING: WEAR FULL PROTECTIVE CLOTHING AND SELF-CONTAINED BREATHING EQUIPMENT.
DISPOSAL: CONTACT MANUFACTURER AND AUTHORITIES.

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IRRITATING. WILL NOT BURN.
COOL CONTAINERS WITH WATER IF EXPOSED TO FIRE TO PREVENT BURSTING. MAY DECOMPOSE IN FIRE RELEASING PRODUCTS OF GREATER HAZARDS.
FIRES: IN CONTACT WITH FIRE USE FIRE EXTINGUISHING MEDIA SUITABLE FOR MATERIAL WHICH IS ACTUALLY BURNING. DIKE WATER RUNOFF. PREVENT ENTRY INTO SEWERS OR NATURAL WATERS.
CLOTHING: WEAR FULL PROTECTIVE CLOTHING AND SELF-CONTAINED BREATHING APPARATUS.

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EYES: IRRIGATION IMMEDIATELY WITH WATER FOR 5 MINUTES IS GOOD SAFETY PRACTICE.
SKIN: WASH OFF IN FLOWING WATER OR SHOWER.
CLOTHING: REMOVE CONTAMINATED CLOTHING AND WASH BEFORE REUSE. USE EXTRA CARE WITH SHOES. AIR THOROUGHLY.
INHALATION: REMOVE TO FRESH AIR IF EFFECTS OCCUR. IF NOT BREATHING, GIVE MOUTH-TO-MOUTH RESUSCITATION. IF BREATHING DIFFICULT, GIVE OXYGEN. CALL A PHYSICIAN.

The information contained herein is hereby presented as a complimentary act, in good faith, and is, to the best of The Dow Chemical Company's knowledge and belief, accurate and reliable as of the date printed, but may well be incomplete. No representation, guarantee or warranty is made as to its accuracy, reliability or completeness and, as Governmental regulations and use conditions may change, it is the user's responsibility to determine the current appropriateness and suitability for specific and uses prior to use.





TRANSPORTATION EQUIPMENT DATA

- EMERGENCY DATA
ON OTHER SIDE -

PRODUCT		CODE NO.	DATE ISSUED OR REVISED
PERCHLOROETHYLENE (VARIOUS GRADES)		See below	JUL 18 1983
SYNOPSIS (DS, FC, INDUSTRIAL & SVC GRADE)		TAX COMMODITY Chlorinated Solvent	
CHARACTERISTICS	DOT SHIPPING NAME		DOT HAZARD CLASS
	Flash Point		Boiling Point
	None		250°F (Approx.)
	Freezing Point		Vapor Density (air = 1)
	-8°F		Greater than air
CHARACTERISTICS	Loading Temp.		Max. Product Temp.
	Ambient		---
	Max. Steam Pressure		---
Typical Density (lb/gal) (20°C)		Solubility in Water	
Average 13.5		Does not mix	
Concentration Shipped		Physical State	
Full strength		Liquid	

APPROVED EQUIPMENT:

TANK TRUCK		TANK CAR
TANK TYPE.	MC 303(1), 304(2), 306(1), 307(2) 311(2), 312(2).	DOT 103W, 111A60W-1, 111A100W-1
TANK MATERIALS.	Stainless steel, ALUMINUM, lined steel	Carbon steel, lined steel
INSULATION.	Not required	Not required
STEAMCOILS.	Not required	Not required
METHOD USED TO CLEAN TANK.	Drain, flush with water, steam, rinse thoroughly and dry.	Drain, steam, wash with water and dry.
PUMP TYPES	Stainless steel or steel Centrifugal or positive displacement	
HOSE TYPES.	Seamless stainless steel, Teflon, seamless bronze, cross-linked P/E(3), Viton(3) (Uniroyal or Goodyear)	
GASKETS.	Teflon, Asbestos, Viton, (Leather - single use only)	
OTHER:	(1) MUST BE EQUIPPED WITH PRESSURE HATCH - 25 psig Min. (2) PREFERRED EQUIPMENT. (3) MAY BE USED ONLY FOR INTERMITTENT SERVICE. DO NOT USE IN PERMANENT INSTALLATIONS.	

HANDLING:

HOW UNLOADED	Pump or air pressure. (Pressure NOT approved for MC 303 and 306 tanks.)
PROBLEMS	AVOID CONTACT WITH EYES, SKIN AND CLOTHING. AVOID BREATHING VAPORS.
PRECAUTIONS	USE PROTECTIVE EQUIPMENT - MINIMUM OF CHEMICAL WORKERS GOGGLES HARD HAT, RUBBER GLOVES AND RUBBER BOOTS. HAVE RESPIRATOR AVAILABLE.
OTHER:	Grades: DS - #59063 FC - #59007 Industrial - #59009 SVC - #59010

HER 03356

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M A T E R I A L S A F E T Y D A T A S H E E T

Dow Chemical U.S.A.* Midland, MI 48674 Emergency Phone: 517-636-4400

Product Code: 08931

Page: 1

PRODUCT NAME: DICYCLOPENTADIENE POLYESTER GRADE

Effective Date: 06/13/90 Date Printed: 06/19/90

MSDS:001076

1. INGREDIENTS: (% w/w, unless otherwise noted)

Dicyclopentadiene	CAS# 000077-73-6	82-85%
Codimers including:		BALANCE
Butadiene/cyclopentadiene codimer	CAS# 003048-64-4	
Isoprene/cyclopentadiene codimer	CAS# 083484-77-9	
Methyl cyclopentadiene dimer	CAS# 025321-13-5	
Benzene	CAS# 000071-43-2	0.09% Max.
Lights (C6 and lighter hydrocarbons, each of which is less than 1%)		~5% Max.

This document is prepared pursuant to the OSHA Hazard Communication Standard (29 CFR 1910.1200). In addition, other substances not "Hazardous" per this OSHA Standard may be listed. Where proprietary ingredient shows, the identity may be made available as provided in this standard.

2. PHYSICAL DATA:

BOILING POINT: 338F, 170C
VAP PRESS: 36.5 mmHg @ 20
VAP DENSITY: 4.6
SOL. IN WATER: <0.01%
SP. GRAVITY: 0.96
APPEARANCE: White liquid.
ODOR: Camphorlike odor.

3. FIRE AND EXPLOSION HAZARD DATA:

FLASH POINT: 40F-90F, 4-32C
METHOD USED: TCC

(Continued on Page 2)

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M A T E R I A L S A F E T Y D A T A S H E E T

Dow Chemical U.S.A.* Midland, MI 48674 Emergency Phone: 517-636-4400

Product Code: 08931

Page: 2

PRODUCT NAME: DICYCLOPENTADIENE POLYESTER GRADE

Effective Date: 06/13/90 Date Printed: 06/19/90

MSDS-901076

3. FIRE AND EXPLOSION HAZARD DATA: (CONTINUED)

FLAMMABLE LIMITS

LFL: 1%

UFL: 7%

EXTINGUISHING MEDIA: Water fog, foam, alcohol-resistant foam, CO2, dry chemical.

FIRE & EXPLOSION HAZARDS: Flammable material. Use water to keep fire-exposed containers cool. Keep vapors away from possible ignition sources.

FIRE-FIGHTING EQUIPMENT: Wear positive-pressure, self-contained breathing apparatus.

4. REACTIVITY DATA:

STABILITY: (CONDITIONS TO AVOID) Avoid temperatures above 302F, 150C; dicyclopentadiene will decompose to two moles of cyclopentadiene.

INCOMPATIBILITY: (SPECIFIC MATERIALS TO AVOID) Acid, oxidizing material, polymerization catalysts such as boron or aluminum trichlorides.

HAZARDOUS DECOMPOSITION PRODUCTS: Cyclopentadiene (can cause rapid pressure increases at elevated temperatures i.e. greater than 150C).

HAZARDOUS POLYMERIZATION: May occur. Avoid high temperatures or acid catalysts as noted above.

5. ENVIRONMENTAL AND DISPOSAL INFORMATION:

(Continued on Page 3)

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Product Code: 08931

Page: 3

PRODUCT NAME: DICYCLOPENTADIENE POLYESTER GRADE

Effective Date: 06/13/90 Date Printed: 06/19/90

MSDS:001076

5. ENVIRONMENTAL AND DISPOSAL INFORMATION:

ACTION TO TAKE FOR SPILLS/LEAKS: Remove all sources of ignition. Keep people away. Ventilate enclosed area. Small leak or spill: Absorb with suitable agent (sand). Large leak or spill: Dike and recover dicyclopentadiene to be burned or purified for reuse.

DISPOSAL METHOD: Burn in an approved incinerator in accordance with all federal, state and local regulations.

6. HEALTH HAZARD DATA:

EYE: May cause slight transient (temporary) eye irritation.

SKIN CONTACT: Prolonged or repeated exposure may cause skin irritation, even a burn.

SKIN ABSORPTION: A single prolonged exposure is not likely to result in the material being absorbed through skin in harmful amounts. The dermal LD50 has not been determined.

INGESTION: Single dose oral toxicity is believed to be moderate to low. Single dose oral LD50 has not been determined. If aspirated (liquid enters the lung), may be rapidly absorbed through the lungs and result in injury to other body systems.

INHALATION: Excessive vapor concentrations are attainable and a single exposure may cause death. The LC50 for dicyclopentadiene in rats was 360-385 ppm for four hours.

SYSTEMIC (OTHER TARGET ORGAN) EFFECTS: Excessive exposure may cause lung, central nervous system, liver and kidney effects.

TERATOLOGY (BIRTH DEFECTS): Birth defects are unlikely.

(Continued on Page 4)

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M A T E R I A L S A F E T Y D A T A S H E E T

Dow Chemical U.S.A.* Midland, MI 48674 Emergency Phone: 517-636-4400

Product Code: 08931

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PRODUCT NAME: DICYCLOPENTADIENE POLYESTER GRADE

Effective Date: 06/13/90 Date Printed: 06/19/90

MSDS:001076

6. HEALTH HAZARD DATA: (CONTINUED)

Exposures having no adverse effects on the mother should have no effect on the fetus.

REPRODUCTIVE EFFECTS: In animal studies, has been shown not to interfere with reproduction.

MUTAGENICITY (EFFECTS ON GENETIC MATERIAL): Results of in-vitro ("test tube") mutagenicity tests have been negative.

shown not to interfere with reproduction. Results of in-vitro ("test tube") mutagenicity tests on dicyclopentadiene have been negative.

7. FIRST AID:

EYES: Irrigate immediately with water for at least five minutes.

SKIN: Wash off in flowing water or shower.

INGESTION: Do not induce vomiting. Call a physician and/or transport to emergency facility immediately.

INHALATION: Remove to fresh air. If not breathing, give mouth-to-mouth resuscitation. If breathing is difficult, give oxygen. Call a physician.

NOTE TO PHYSICIAN: Because rapid absorption may occur through lungs if aspirated and cause systemic effects, the decision of whether to induce vomiting or not should be made by a physician. If lavage is performed, suggest endotracheal and/or esophageal control. Danger from lung aspiration must be weighed against toxicity when considering emptying the

(Continued on Page 5)

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PRODUCT NAME: DICYCLOPENTADIENE POLYESTER GRADE

Effective Date: 06/13/90 Date Printed: 06/19/90

MSDS:001076

7. FIRST AID: (CONTINUED)

stomach. If burn is present, treat as any thermal burn, after decontamination. No specific antidote. Supportive care. Treatment based on judgment of the physician in response to reactions of the patient.

8. HANDLING PRECAUTIONS:

EXPOSURE GUIDELINE(S): ACGIH TLV is 5 ppm for dicyclopentadiene. Benzene: OSHA PEL is 1 ppm TWA and 5 ppm STEL. Dow IHG is 10 ppm, Ceiling. ACGIH TLV is 10 ppm, A2.

VENTILATION: Provide general and/or local exhaust ventilation to control airborne levels below the exposure guidelines.

RESPIRATORY PROTECTION: Atmospheric levels should be maintained below the exposure guideline. When respiratory protection is required for certain operations, use an approved air-purifying respirator. For emergency and other conditions where the exposure guideline may be greatly exceeded, use an approved positive-pressure, self-contained breathing apparatus. In confined or poorly ventilated areas, use an approved positive-pressure, self-contained breathing apparatus.

SKIN PROTECTION: When prolonged or frequently repeated contact could occur, use protective clothing impervious to this material. Selection of specific items such as gloves, boots, apron or full-body suit will depend on operation.

EYE PROTECTION: Use safety glasses.

9. ADDITIONAL INFORMATION:

(Continued on Page 6)

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M A T E R I A L S A F E T Y D A T A S H E E T

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Product Code: 08931

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PRODUCT NAME: DICYCLOPENTADIENE POLYESTER GRADE

Effective Date: 06/13/90 Date Printed: 06/19/90

MSDS:001076

9. ADDITIONAL INFORMATION:

SPECIAL PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:

Do not breathe vapors. Avoid skin and eye contact. Keep product away from heat, sparks, and open flame. Do not cut or weld containers.

MSDS STATUS: Revised section 9 and regsheet.

(Continued on Page 7)

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M A T E R I A L S A F E T Y D A T A S H E E T

Dow Chemical U.S.A.* Midland, MI 48674 Emergency Phone: 517-636-4400

Product Code: 08931

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PRODUCT NAME: DICYCLOPENTADIENE POLYESTER GRADE

Effective Date: 06/13/90 Date Printed: 06/19/90

MSDS:001076

REGULATION INFORMATION: (Not meant to be all-inclusive--selected regulations represented.)

NOTICE: The information herein is presented in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ from one location to another; it is the buyer's responsibility to ensure that its activities comply with federal, state or provincial, and local laws. The following specific information is made for the purpose of complying with numerous federal, state or provincial, and local laws and regulations. See MSD Sheet for health and safety information.

U.S. REGULATIONS

SARA HAZARD CATEGORY: This product has been reviewed according to the EPA "Hazard Categories" promulgated under Sections 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 (SARA Title III) and is considered, under applicable definitions, to meet the following categories:

An immediate health hazard
A delayed health hazard
A fire hazard

CANADA REGULATIONS

The Workplace Hazardous Materials Information System (W.H.M.I.S.)
Classification for this product is:

B2
D1A
D2A

(Continued on Page 8)

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M A T E R I A L S A F E T Y D A T A S H E E T

Dow Chemical U.S.A.* Midland, MI 48674 Emergency Phone: 517-636-4400

Product Code: 08931 Page: 8

PRODUCT NAME: DICYCLOPENTADIENE POLYESTER GRADE

Effective Date: 06/13/90 Date Printed: 06/13/90 MSDS:001076

The Transportation of Dangerous Goods Act (T.D.G.A.) classification for this product is:

Not regulated

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Express Or Implied, Is Made. Consult The Dow Chemical Company
For further information.

HER 03364

**MATERIAL SAFETY
DATA SHEET**



South Point Ethanol
P.O. Box 1004
South Point, Ohio 45680
Phone: 614/377-2765

Page: 1

ETHANOL

THIS MSDS COMPLIES WITH 29 CFR 1910.1200 (THE HAZARD COMMUNICATION STANDARD).

Product Name: Ethyl Alcohol (Ethanol), Anhydrous, denatured
CAS NUMBER: 1G LIST -- 64-17-5

Prepared 02-26-89
Supersedes 03-04-86

SECTION I - PRODUCT IDENTIFICATION

General or Generic ID: ALCOHOL

DOT Hazard Classification: FLAMMABLE LIQUID (173.115)

SECTION II - COMPONENTS

IF PRESENT, IARC, NTP AND OSHA CARCINOGENS AND CHEMICALS SUBJECT TO THE REPORTING
REQUIREMENTS OF SARA TITLE III SECTION 313 ARE IDENTIFIED IN THIS SECTION
SEE DEFINITION PAGE FOR CLARIFICATION

INGREDIENT	% (by VOL)	PEL	TLV	Note
ETHYL ALCOHOL CAS #: 64-17-5	95	1000 PPM	1000 PPM	
ALIPHATIC PETROLEUM DISTILLATES	5	500 PPM	400 PPM	

SECTION III PHYSICAL DATA

Boiling Point	for PRODUCT	158.00 - (70.00 - u	179.60 Deg F 82.00 Deg C 760.00 mm Hg
Vapor Pressure	for PRODUCT	u	45.00 mm Hg 68.00 Deg F 20.00 Deg C
Specific Vapor Density			HEAVIER THAN AIR
Specific Gravity		.787 - u	.797 60.00 Deg F (15.55 Deg C)
Percent Volatiles			100.00%
Evaporation Rate	(ETHYL ETHER = 1)		6.80

SECTION IV FIRE AND EXPLOSION INFORMATION

FLASH POINT 55.0 Deg F (12.8 Deg C)
EXPLOSIVE LIMIT (PRODUCT) LOWER - 3.3%
EXTINGUISHING MEDIA: ALCOHOL FOAM OR WATER FOG OR CARBON DIOXIDE OR DRY CHEMICAL
HAZARDOUS DECOMPOSITION PRODUCTS: MAY FORM TOXIC MATERIALS: CARBON DIOXIDE AND CARBON MONOXIDE, ETC.
FIREFIGHTING PROCEDURES: WEAR SELF-CONTAINED BREATHING APPARATUS WITH A FULL FACEPIECE OPERATED IN THE POSITIVE PRESSURE DEMAND MODE WHEN FIGHTING FIRES.
SPECIAL FIRE & EXPLOSION HAZARDS: VAPORS ARE HEAVIER THAN AIR AND MAY TRAVEL ALONG THE GROUND OR MAY BE MOVED BY VENTILATION AND IGNITED BY PILOT LIGHTS, OTHER FLAMES, SPARKS, HEATERS, SMOKING, ELECTRIC MOTORS, STATIC DISCHARGE, OR OTHER IGNITION SOURCES AT LOCATIONS DISTANT FROM MATERIAL HANDLING POINT
NEVER USE WELDING OR CUTTING TORCH ON OR NEAR DRUM (EVEN EMPTY) BECAUSE PRODUCT (EVEN JUST RESIDUE) CAN IGNITE EXPLOSIVELY.
NFPA CODES: HEALTH - 0 FLAMMABILITY - 3 REACTIVITY - 0

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SECTION V HEALTH HAZARD DATA

PERMISSIBLE EXPOSURE LEVEL: NOT ESTABLISHED FOR PRODUCT. SEE SECTION II.

EFFECTS OF ACUTE OVEREXPOSURE: FOR PRODUCT

EYES: CAN CAUSE MODERATE IRRITATION, REDNESS, TEARING.

SKIN: CAN CAUSE SLIGHT IRRITATION.

BREATHING: EXCESSIVE INHALATION OF VAPORS CAN CAUSE NASAL AND RESPIRATORY IRRITATION.

SWALLOWING: CAN CAUSE GASTROINTESTINAL IRRITATION, NAUSEA, VOMITING, AND DIARRHEA.

FIRST AID:

IF ON SKIN: THOROUGHLY WASH EXPOSED AREA WITH SOAP AND WATER. REMOVE CONTAMINATED CLOTHING. LAUNDER CONTAMINATED CLOTHING BEFORE RE-USE.

IF IN EYES: FLUSH WITH LARGE AMOUNTS OF WATER. LIFTING UPPER AND LOWER LIDS OCCASIONALLY. GET MEDICAL ATTENTION.

IF SWALLOWED: IMMEDIATELY DRINK TWO GLASSES OF WATER AND INDUCE VOMITING BY EITHER GIVING IPECAC SYRUP OR BY PLACING FINGER AT BACK OF THROAT. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON. GET MEDICAL ATTENTION IMMEDIATELY.

IF BREATHED: IF AFFECTED, REMOVE INDIVIDUAL TO FRESH AIR. IF BREATHING IS DIFFICULT, ADMINISTER OXYGEN. IF BREATHING HAS STOPPED GIVE ARTIFICIAL RESPIRATION. KEEP PERSON WARM, QUIET AND GET MEDICAL ATTENTION.

PRIMARY ROUTE(S) OF ENTRY:

INHALATION, SKIN CONTACT

EFFECTS OF CHRONIC OVEREXPOSURE: FOR PRODUCT

OVEREXPOSURE TO THIS MATERIAL (OR ITS COMPONENTS) HAS APPARENTLY BEEN FOUND TO CAUSE THE FOLLOWING EFFECTS IN LABORATORY ANIMALS: LIVER ABNORMALITIES

OVEREXPOSURE TO THIS MATERIAL (OR ITS COMPONENTS) HAS BEEN SUGGESTED AS A CAUSE OF THE FOLLOWING EFFECTS IN HUMANS: LIVER ABNORMALITIES, EYE DAMAGE

SECTION VI REACTIVITY DATA

HAZARDOUS POLYMERIZATION: CANNOT OCCUR

STABILITY: STABLE

INCOMPATIBILITY: AVOID CONTACT WITH: STRONG OXIDIZING AGENTS.

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:

SMALL SPILL: ABSORB LIQUID ON PAPER, VERMICULITE, FLOOR ABSORBENT, OR OTHER ABSORBENT MATERIAL AND TRANSFER TO HOOD.

LARGE SPILL: ELIMINATE ALL IGNITION SOURCES (FLARES, FLAMES INCLUDING PILOT LIGHTS, ELECTRICAL SPARKS). PERSONS NOT WEARING PROTECTIVE EQUIPMENT SHOULD BE EXCLUDED FROM AREA OF SPILL UNTIL CLEAN-UP HAS BEEN COMPLETED. STOP SPILL AT SOURCE, DIKE AREA OF SPILL TO PREVENT SPREADING. PUMP LIQUID TO SALVAGE TANK. REMAINING LIQUID MAY BE TAKEN UP ON SAND, CLAY, EARTH, FLOOR ABSORBENT, OR OTHER ABSORBENT MATERIAL AND SHOVELED INTO CONTAINERS.

PREVENT RUN-OFF TO SEWERS, STREAMS OR OTHER BODIES OF WATER. IF RUN-OFF OCCURS, NOTIFY PROPER AUTHORITIES AS REQUIRED. THAT A SPILL HAS OCCURRED.

WASTE DISPOSAL METHOD:

SMALL SPILL: ALLOW VOLATILE PORTION TO EVAPORATE IN HOOD. ALLOW SUFFICIENT TIME FOR VAPORS TO COMPLETELY CLEAR HOOD DUCT WORK. DISPOSE OF REMAINING MATERIAL IN ACCORDANCE WITH APPLICABLE REGULATIONS.

LARGE SPILL: DESTROY BY LIQUID INCINERATION.

CONTAMINATED ABSORBENT MAY BE DEPOSITED IN A LANDFILL IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS.

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SECTION VIII PROTECTIVE EQUIPMENT TO BE USED

RESPIRATORY PROTECTION: IF WORKPLACE EXPOSURE LIMIT(S) OF PRODUCT OR ANY COMPONENT IS EXCEEDED (SEE SECTION III), A NIOSH/MSHA APPROVED AIR SUPPLIED RESPIRATOR IS ADVISED IN ABSENCE OF PROPER ENVIRONMENTAL CONTROL. OSHA REGULATIONS ALSO PERMIT OTHER NIOSH/MSHA RESPIRATORS (NEGATIVE PRESSURE TYPE) UNDER SPECIFIED CONDITIONS (SEE YOUR SAFETY EQUIPMENT SUPPLIER). ENGINEERING OR ADMINISTRATIVE CONTROLS SHOULD BE IMPLEMENTED TO REDUCE EXPOSURE.

VENTILATION: PROVIDE SUFFICIENT MECHANICAL (GENERAL AND/OR LOCAL EXHAUST) VENTILATION TO MAINTAIN EXPOSURE BELOW TLV(S).

PROTECTIVE GLOVES: WEAR RESISTANT GLOVES SUCH AS NEOPRENE

EYE PROTECTION: CHEMICAL SPLASH GOGGLES IN COMPLIANCE WITH OSHA REGULATIONS ARE ADVISED. HOWEVER, OSHA REGULATIONS ALSO PERMIT OTHER TYPE SAFETY GLASSES. (CONSULT YOUR SAFETY EQUIPMENT SUPPLIER)

OTHER PROTECTIVE EQUIPMENT: TO PREVENT REPEATED OR PROLONGED SKIN CONTACT, WEAR IMPERVIOUS CLOTHING AND BOOTS.

SECTION IX SPECIAL PRECAUTIONS OR OTHER COMMENTS

CONTAINERS OF THIS MATERIAL MAY BE HAZARDOUS WHEN EMPTIED. SINCE EMPTIED CONTAINERS RETAIN PRODUCT RESIDUES (VAPOR, LIQUID, AND/OR SOLID), ALL HAZARD PRECAUTIONS GIVEN IN THIS DATASHEET MUST BE OBSERVED. THE INFORMATION ACCUMULATED HEREIN IS BELIEVED TO BE ACCURATE BUT IS NOT WARRANTED TO BE WHETHER ORIGINATING WITH THE COMPANY OR NOT. RECIPIENTS ARE ADVISED TO CONFIRM IN ADVANCE OF NEED THAT THE INFORMATION IS CURRENT, APPLICABLE, AND SUITABLE TO THEIR CIRCUMSTANCES.

DEFINITIONS

This definition page is intended for use with Material Safety Data Sheets supplied by South Point Ethanol. Recipients of these data sheets should consult the OSHA Safety and Health Standards (29 CFR 1910), particularly subpart G - Occupational Health and Environmental Control, and subpart I - Personal Protective Equipment, for general guidance on control of potential Occupational Health and Safety Hazards.

SECTION I PRODUCT IDENTIFICATION

GENERAL OR GENERIC ID: Chemical family or product description.

DOT HAZARD CLASSIFICATION: Product meets DOT criteria for hazards listed.

SECTION II COMPONENTS

Components are listed in this section if they present a physical or health hazard and are present at or above 1% in the mixture. If a component is identified as a CARCINOGEN by NTP, IARC or OSHA as of the date on the MSDS, it will be listed and footnoted in this section when present at or above 0.1% in the product. Negative conclusions concerning carcinogenicity are not reported. Additional health information may be found in Section V. Components subject to the reporting requirements of Section 313 of SARA Title III are identified in the footnotes in this section, along with typical percentages. Other components may be listed if deemed appropriate.

Exposure recommendations are for components. OSHA Permissible Exposure Limits (PELs) and American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLVs) appear on the line with the component identification. Other recommendations appear as footnotes.

SECTION III PHYSICAL DATA

BOILING POINT: Of product if known. The lowest value of the components is listed for mixtures.

VAPOR PRESSURE: Of product if known. The highest value of the components is listed for mixtures.

SPECIFIC VAPOR DENSITY: Compared to AIR = 1. If Specific Vapor Density of product is not known, the value is expressed as lighter or heavier than air.

SPECIFIC GRAVITY: Compared to WATER = 1. If Specific Gravity of product is not known, the value is expressed as less than or greater than water.

pH: If applicable.

PERCENT VOLATILES: Percentage of material with initial boiling point below 425 degrees Fahrenheit.

EVAPORATION RATE: Indicated as faster or slower than ETHYL ETHER, unless otherwise stated.

SECTION IV FIRE AND EXPLOSION DATA

FLASH POINT: Method identified.

EXPLOSION LIMITS: For product if known. The lowest value of the components is listed for mixtures.

HAZARDOUS DECOMPOSITION PRODUCTS: Known or expected hazardous products resulting from heating, burning or other reactions.

EXTINGUISHING MEDIA: Following National Fire Protection Association criteria.

ADDITIONAL COMMENTS

Containers should be either reconditioned by CERTIFIED firms or properly disposed of by APPROVED firms. Disposal of containers should be in accordance with applicable laws and regulations. "EMPTY" drums should not be given to individuals. Serious accidents have resulted from the misuse of "EMPTIED" containers (drums, pails, etc.). Refer to Sections IV and IX.

SECTION IV (cont.)

FIREFIGHTING PROCEDURES: Minimum equipment to protect firefighters from toxic products or vaporization, combustion or decomposition in fire situations. Other firefighting hazards may also be indicated.

SPECIAL FIRE AND EXPLOSION HAZARDS: States hazards not covered by other sections.

NFPA CODES: Hazard ratings assigned by the National Fire Protection Association.

SECTION V HEALTH HAZARD DATA

PERMISSIBLE EXPOSURE LIMIT: For product.

THRESHOLD LIMIT VALUE: For product.

EFFECTS OF ACUTE OVEREXPOSURE: Potential local and systemic effects due to single or short term overexposure to the eyes and skin or through inhalation or ingestion.

EFFECTS OF CHRONIC OVEREXPOSURE: Potential local and systemic effects due to repeated or long term overexposure to the eyes and skin or through inhalation or ingestion.

FIRST AID: Procedures to be followed when dealing with accidental overexposure.

PRIMARY ROUTE OF ENTRY: Based on properties and expected use.

SECTION VI REACTIVITY DATA

HAZARDOUS POLYMERIZATION: Conditions to avoid to prevent hazardous polymerization resulting in a large release of energy.

STABILITY: Conditions to avoid to prevent hazardous or violent decomposition.

INCOMPATIBILITY: Materials and conditions to avoid to prevent hazardous reactions.

SECTION VII SPILL OR LEAK PROCEDURES

Reasonable precautions to be taken and methods of containment, clean-up and disposal. Consult federal, state and local regulations for accepted procedures and any reporting or notification requirements.

SECTION VIII PROTECTIVE EQUIPMENT TO BE USED

Protective equipment which may be needed when handling the product.

SECTION IX SPECIAL PRECAUTIONS OR OTHER COMMENTS

Covers relevant points not previously mentioned.

SECTION X LABEL INFORMATION

Contains label information including physical and health hazard warnings, handling and first aid instructions appropriate for the product.



UNION CARBIDE CHEMICALS AND PLASTICS COMPANY INC.

Industrial Chemicals Division

MATERIAL SAFETY DATA SHEET

EFFECTIVE DATE 03/20/92



Union Carbide urges each customer or recipient of this MSDS to study it carefully to become aware of and understand the hazards associated with the product. The reader should consider consulting reference works or individuals who are experts in ventilation, toxicology, and fire prevention, as necessary or appropriate to use and understand the data contained in this MSDS.

To promote safe handling, each customer or recipient should: (1) notify its employees, agents, contractors and others whom it knows or believes will use this material of the information in this MSDS and any other information regarding hazards or safety; (2) furnish this same information to each of its customers for the product; and (3) request its customers to notify their employees, customers, and other users of the product of this information.

I. IDENTIFICATION

PRODUCT NAME: DIETHANOLAMINE

CHEMICAL NAME: Diethanolamine

CHEMICAL FAMILY: Alkanolamines

FORMULA: $\text{HN}-(\text{CH}_2\text{CH}_2\text{OH})_2$

MOLECULAR WEIGHT: 105.14

SYNONYMS: 2,2'-iminodiethanol; Dihydroxyethylamine;
B,B'-dihydroxyethylamine; DEA

CAS # AND NAME: 111-42-2
Ethanol, 2,2'-iminobis-

II. PHYSICAL DATA (Determined on Typical Material)

BOILING POINT, 760 mm Hg: Decomposes
>268°C (>514°F)

SPECIFIC GRAVITY(H₂O = 1): 1.092 AT 30/20°C

FREEZING POINT: 28°C (82°F)

VAPOR PRESSURE AT 20°C: <0.01 mmHg

VAPOR DENSITY (AIR = 1): 3.6

EVAPORATION RATE (Butyl Acetate = 1): <0.01

SOLUBILITY IN WATER by wt: 96% AT 20°C

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UNION CARBIDE CHEMICALS AND PLASTICS COMPANY INC
Industrial Chemicals Division
39 Old Kidgebory Road, Danbury, CT 06817-0001

HER 03369

PRODUCT NAME: DIETHANOLAMINE

PAGE 2

APPEARANCE: Transparent colorless
Above freezing point
Opaque white
Below freezing point

ODOR: Amine

PHYSICAL STATE: Liquid above freezing point
Solid below freezing point

III. INGREDIENTS

%	MATERIAL	CAS#	EXPOSURE LIMIT
100%	Diethanolamine	111-42-2	3 ppm-TWAB, ACGIH, OSHA

IV. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT(test method(s)): 336°F
Pensky-Martens closed cup(ASTM D93)
330°F
Cleveland open cup(ASTM D92)

FLAMMABLE LIMITS IN AIR LOWER: Not determined
% by volume: UPPER: Not determined

SPECIAL FIRE FIGHTING PROCEDURES: Do not direct a solid stream of water or foam into burning molten material; this may cause spattering and spread the fire.
Use self-contained breathing apparatus, eye protection and protective clothing.

EXTINGUISHING MEDIA: Apply alcohol-type or all-purpose-type foams by manufacturer's recommended techniques for large fires. Use carbon dioxide or dry chemical media for small fires.

UNUSUAL FIRE AND EXPLOSION HAZARDS: During fire, oxides of nitrogen may be evolved.

V. HEALTH HAZARD DATA

EXPOSURE LIMIT(S): See Section III.

EFFECTS OF SINGLE OVEREXPOSURE:

SWALLOWING: May cause irritation of the mouth and throat, abdominal discomfort, nausea, vomiting, and diarrhea.
Aspiration into the lungs may occur during ingestion or vomiting, resulting in lung injury.
Loss of consciousness may occur.
Dizziness and drowsiness may occur.
Weakness and incoordination may occur.

SKIN ABSORPTION: No evidence of harmful effects from available information.

HER 03370

PRODUCT NAME: DIETHANOLAMINE

PAGE 2

APPEARANCE: Transparent colorless
Above freezing point
Opaque white
Below freezing point

ODOR: Amine

PHYSICAL STATE: Liquid above freezing point
Solid below freezing point

III. INGREDIENTS

%	MATERIAL	CAS#	EXPOSURE LIMIT
100	Diethanolamine	111-42-2	3 ppm-TWA8, ACGH, OSHA

IV. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT(test method(s)): 336°F
Pensky-Martens closed cup(ASTM D93)
330°F
Cleveland open cup(ASTM D92)

FLAMMABLE LIMITS IN AIR LOWER: Not determined
% by volume: UPPER: Not determined

SPECIAL FIRE FIGHTING PROCEDURES: Do not direct a solid stream of water or foam into burning molten material; this may cause spattering and spread the fire.
Use self-contained breathing apparatus, eye protection and protective clothing.

EXTINGUISHING MEDIA: Apply alcohol-type or all-purpose-type foams by manufacturer's recommended techniques for large fires. Use carbon dioxide or dry chemical media for small fires.

UNUSUAL FIRE AND EXPLOSION HAZARDS: During fire, oxides of nitrogen may be evolved.

V. HEALTH HAZARD DATA

EXPOSURE LIMIT(S): See Section III.

EFFECTS OF SINGLE OVEREXPOSURE:

SWALLOWING: May cause irritation of the mouth and throat, abdominal discomfort, nausea, vomiting, and diarrhea.
Aspiration into the lungs may occur during ingestion or vomiting, resulting in lung injury.
Loss of consciousness may occur.
Dizziness and drowsiness may occur.
Weakness and incoordination may occur.

SKIN ABSORPTION: No evidence of harmful effects from available information.

HER 03371

INHALATION: Vapor or mist from heated material may cause irritation of the respiratory tract, experienced as nasal discomfort and discharge, with chest pain and coughing.

SKIN CONTACT: Brief contact may cause slight irritation with itching and local redness. Prolonged contact may cause more severe irritation, with discomfort or pain, local redness and swelling, and possible tissue destruction.

EYE CONTACT: Excess redness and swelling of the conjunctiva may occur. May cause irritation, experienced as stinging with excess blinking and tear production. Corneal injury may occur.

EFFECTS OF REPEATED OVEREXPOSURE:
Repeated overexposure may cause damage to kidneys and liver.

MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE:
May aggravate an existing dermatitis.
Inhalation of material may aggravate asthma and inflammatory or fibrotic pulmonary disease.

SIGNIFICANT LABORATORY DATA WITH POSSIBLE REVELANCE TO HUMAN HEALTH HAZARD EVALUATION:
There are reports that ingestion of diethanolamine (DEA) produced nervous system injury in dogs and cats. Heart and salivary gland lesions have also been observed in mice treated with DEA cutaneously and in drinking water. Rats given high doses of DEA developed anemia and testicular lesions. No embryofetal toxicity or malformations were observed in rats treated cutaneously with DEA. Increased incidence of some skeletal variations suggestive of a slight developmental delay was seen only in the fetuses of animals given 1500 mg/kg/day which also caused significant maternal toxicity. Contains one or more amines which may react with nitrites or other nitrosating agents to form nitrosamines. Some nitrosamines have been shown to be carcinogenic in laboratory animals.

OTHER EFFECTS OF OVEREXPOSURE:
None currently known.

EMERGENCY AND FIRST AID PROCEDURES:

SWALLOWING: If patient is fully conscious, give two glasses of water. DO NOT INDUCE VOMITING. Obtain medical attention.

SKIN: Remove contaminated clothing. Wash skin with soap and water. Obtain medical attention if irritation persists. Wash clothing before reuse.

INHALATION: Remove to fresh air.

EYES: Immediately flush eyes with water and continue washing for at least 15 minutes. Obtain medical attention without delay, preferably from an ophthalmologist.

NOTES TO PHYSICIAN: There is no specific antidote. Treatment of overexposure should be directed at the control of symptoms and the clinical condition of the patient. The hazards of this material are due mainly to its severely irritant properties on skin and mucosal surfaces. Due to the irritant nature of the material, the stomach should be evacuated carefully in cases of poisoning by swallowing.

VI. REACTIVITY DATA

PRODUCT NAME: DIETHANOLAMINE

PAGE 4

STABILITY: Stable

CONDITIONS TO AVOID: Temperatures above 250 degrees C.
May undergo self-sustaining thermal decomposition.

INCOMPATIBILITY (materials to avoid):
Strong oxidizing agents.
Strong bases.
Strong acids.
Aldehydes.
Ketones.
Acrylates.
Organic anhydrides.
Organic halides.
Formates
Oxalates

HAZARDOUS COMBUSTION OR DECOMPOSITION PRODUCTS:
Burning can produce the following combustion products:
Oxides of carbon and nitrogen.

HAZARDOUS POLYMERIZATION: Will Not Occur

CONDITIONS TO AVOID: None.

VII. SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:
Wear suitable protective equipment; avoid contact with liquid and vapor.
Collect for disposal.

WASTE DISPOSAL METHOD:
Incinerate in a furnace where permitted under Federal, State, and local regulations.
See Section IX, "Other Precautions"

VIII. SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (specify type):
Use self-contained breathing apparatus in high vapor concentrations.

VENTILATION:
General (mechanical) room ventilation is expected to be satisfactory where this product is stored and handled in closed equipment.
Special, local ventilation is needed at points where vapors can be expected to escape to the workplace air.

PROTECTIVE GLOVES: PVC-coated
Rubber

EYE PROTECTION: Monogoggles

OTHER PROTECTIVE EQUIPMENT:
Eye bath, safety shower, and chemical apron.

IX. SPECIAL PRECAUTIONS

HER 03373

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:

WARNING: Harmful if inhaled or swallowed.
Causes eye and skin irritation.
Repeated exposure may cause liver and kidney damage.
Aspiration may cause lung damage.
Avoid breathing vapor.
Do not swallow.
Do not get in eyes, on skin, on clothing.
Keep container closed.
Use with adequate ventilation.
Wash thoroughly after handling.

FOR INDUSTRY USE ONLY

OTHER PRECAUTIONS:

DISPOSAL - Laboratory tests show that, at very low concentration (about 10 ppm), diethanolamine can be degraded in a biological wastewater treatment system. It may be feasible to flush a small spill of diethanolamine to a sanitary sewer, with large amounts of water. However, a large spill might be detrimental to aquatic life. If spilled material cannot be collected, it may be possible to neutralize with dilute hydrochloric acid and, then, land-fill the resulting salt.

WARNING: Sudden release of hot organic chemical vapors or mists from process equipment operating at elevated temperature and pressure, or sudden ingress of air into vacuum equipment, may result in ignitions without the presence of obvious ignition sources. Published "autoignition" or "ignition" temperature values cannot be treated as safe operating temperatures in chemical processes without analysis of the actual process conditions.

Any use of this product in elevated-temperature processes should be thoroughly evaluated to establish and maintain safe operating conditions. Further information is available in a technical bulletin entitled "Ignition Hazards of Organic Chemical Vapors."

X. REGULATORY INFORMATION

STATUS ON SUBSTANCE LISTS:

The concentrations shown are maximum or ceiling levels (weight %) to be used for calculations for regulations. Trade Secrets are indicated by "TS".

FEDERAL EPA

Comprehensive Environmental Response Compensation, and Liability Act of 1980 (CERCLA) requires notification of the National Response Center of release of quantities of Hazardous Substances equal to or greater than the reportable quantities (RQs) in 40 CFR 302.4.

Components present in this product at a level which could require reporting under the statute are:

CHEMICAL	CAS NUMBER	UPPER BOUND CONCENTRATION %
Diethanolamine	111-42-2	100.0

Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III requires emergency planning based on Threshold Planning Quantities (TPQs) and release reporting based on Reportable Quantities (RQs) in 40 CFR 355 (used for SARA 302, 304, 311 and 312).

Components present in this product at a level which could require reporting under the statute are:

*** NONE ***

Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III* requires submission of annual reports of release of toxic chemicals that appear in 40 CFR 372 (for SARA 311-3). This information must be included in all MSDSs that are copied and distributed for this material.

Components present in this product at a level which could require reporting under the statute are:

CHEMICAL	CAS NUMBER	UPPER BOUND CONCENTRATION %
Diethanolamine	111-42-2	100.0

PRODUCT NAME: DIETHANOLAMINE

PAGE 6

Toxic Substances Control Act (TSCA) STATUS:

The ingredients of this product are on the TSCA inventory.

STATE RIGHT-TO-KNOW

CALIFORNIA Proposition 65

This product contains trace levels of N-nitrosodiethanolamine which the State of California has found to cause cancer, birth defects or other reproductive harm.

MASSACHUSETTS Right-To-Know, Substance List (MSL) Hazardous Substances and Extraordinarily Hazardous Substances on the MSL must be identified when present in products.

Components present in this product at a level which could require reporting under the statute are:

HAZARDOUS SUBSTANCES (>= 1%)

CHEMICAL	CAS NUMBER	UPPER BOUND CONCENTRATION %
Diethanolamine	111-42-2	100.0

PENNSYLVANIA Right-to-Know, Hazardous Substance List Hazardous Substances and Special Hazardous Substances on the List must be identified when present in products.

Components present in this product at a level which could require reporting under the statute are:

HAZARDOUS SUBSTANCES (>= 1%)

CHEMICAL	CAS NUMBER	UPPER BOUND CONCENTRATION %
Diethanolamine	111-42-2	100.0

CALIFORNIA SCAQMD RULE 443.1 VOC'S:

Not presently available

NOTE ----

The opinions expressed herein are those of qualified experts within Union Carbide Chemicals and Plastics Company. We believe that the information contained herein is current as of the date of this Material Safety Data Sheet. Since the use of this information and of these opinions and the conditions of the use of the product are not within the control of Union Carbide Chemicals and Plastics Company, it is the user's obligation to determine the conditions of safe use of the product.

REVISED SECTIONS:

The format of this MSDS has been altered slightly. In addition, a number of standard statements have been used in place of product-specific statements. Please review the entire MSDS to insure safe handling and use of this material.

PC: 25369
F NUMBER: N0124F

HER 03375

FOR CHEMICAL EMERGENCY • CALL 1-800-424-9300 IN THE U.S.A.
(1-202-483-7616 OUTSIDE THE CONTINENTAL U.S. AND IN WASHINGTON, D.C.)

EMERGENCY RESPONSE INFORMATION SHEET

FLAMMABLE
LIQUID

PRODUCT: **ETHYLBENZENE**
(ETHYL BENZOL, PHENYL ETHANE)

COMPOSITION: ETHYLBENZENE, MIN. 99.0Z
FORM: LIQUID, COLORLESS
DENSITY: 0.865 (25/25°C)
SOLUBILITY IN WATER: MIXES SLIGHTLY.
FREEZING POINT: -139°F
BOILING POINT: 277°F
FLASH POINT: 59°F (TCO)

PHYSICAL
PROPERTIES:

FLAMMABLE LIMITS: 1-6.7Z
VAPOR HAZARD: FLAMMABLE, IRRITATING,
HARMFUL.
REACTS WITH: ACID, BASE, CORROSIVE
& OXIDIZING MATERIAL.

HAZARDS

ENVIRONMENT:

HER 03376

ANIMAL: AVOID EXPOSURE.

FISH: TOXIC. PREVENT ENTRY INTO NATURAL WATERS.

EXPOSURE:

EYES: PAIN, MODERATE IRRITATION, CORNEAL INJURY NOT EXPECTED.

SKIN: MODERATE IRRITATION.

INHALATION: CAN CAUSE SERIOUS INTERNAL INJURY AND DROWSINESS, IRRITATING.

INGESTION: LOW SINGLE DOSE TOXICITY.

IN CASE OF ACCIDENT

SPILL
or
LEAK

FLAMMABLE. IRRITATING. VAPOR HARMFUL. KEEP UPWIND. ISOLATE AND ROPE OFF AREA. PREVENT PERSONAL CONTACT. DO NOT BREATHE VAPORS.
NO SMOKING OR OPEN FLAMES. SHUT OFF IGNITION AND LEAK IF WITHOUT RISK.
PREVENT IGNITION. PREVENT ENTRY INTO SEWERS OR NATURAL WATERS.
USE NONCOMBUSTIBLE ABSORBENT OR SAND ON SMALL SPILLS AND SWEEP OR SCOOP INTO WASTE CONTAINERS. DIKE LARGE SPILLS AND RECOVER.
CLOTHING: WEAR FULL PROTECTIVE CLOTHING INCLUDING RUBBER GLOVES AND SELF-CONTAINED BREATHING APPARATUS.
DISPOSAL: CONTACT MANUFACTURER AND AUTHORITIES.

FIRE

FLAMMABLE. IRRITATING. VAPOR HARMFUL.
DO NOT PUT OUT FIRES AT VENTS OR OTHER FIRES UNTIL LEAK HAS BEEN SHUT OFF.
SMALL FIRES: USE DRY CHEMICAL OR CARBON DIOXIDE.
LARGE FIRES. USE WATER FOG OR SPRAY OR FOAM. IF FIRE MASSIVE OR ADVANCED EVACUATE, USE MONITOR NOZZLES AND EVACUATE, OR FIGHT FROM A PROTECTED LOCATION. USE MONITOR NOZZLES AND HOSE STREAMS TO COOL CONTAINERS EXPOSED TO FIRES WHILE EVACUATING OR IF DECISION IS TO FIGHT FIRE.
DIKE - PREVENT ENTRY INTO SEWERS OR NATURAL WATERS.
CLOTHING: WEAR FULL TURN OUT CLOTHING AND SELF-CONTAINED BREATHING EQUIP.

FIRST
AID

EYES: IRRIGATE WITH FLOWING WATER IMMEDIATELY AND CONTINUOUSLY FOR 15 MINUTES. REFER TO MEDICAL PERSONNEL.
SKIN: IMMEDIATELY FLUSH WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES WHILE REMOVING CONTAMINATED CLOTHING. CALL A PHYSICIAN.
CLOTHING: REMOVE CONTAMINATED CLOTHING IMMEDIATELY, PREFERABLY UNDER SHOWER, AND WASH BEFORE REUSE. DESTROY CONTAMINATED SHOES.
CLOTHING MAY BE FIRE HAZARD UNTIL CLEANED.
INHALATION: REMOVE TO FRESH AIR IF EFFECTS OCCUR. CONSULT MEDICAL PERSONNEL. IF RESPIRATION STOPS, GIVE MOUTH-TO-MOUTH RESUSCITATION.

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TRANSPORTATION EQUIPMENT DATA

- EMERGENCY DATA
ON OTHER SIDE -

ETHYL BENZENE		CODE NO.	29871	DATE 10/10/10 10/10/10	R-08-01-80
CHARACTERISTICS	Ethyl Benzol		TYPE COMMODITY		
	ETHYL BENZENE		Hydrocarbon liquid		
	FLASH POINT		DOT HAZARD CLASS		
	59°F (TCC)		FLAMMABLE LIQUID		
	FREEZING POINT		BOILING POINT	VAPOR DENSITY (AIR = 1)	
	-119°F		277°F	3.7	
CHARACTERISTICS	MAX. ALLOWED TEMP. (30°C)		MAX. PRODUCT TEMP.	MAX. STEAM PRESSURE	
	7.251		---	---	
	CONCENTRATION SHIPPED		SOLUBILITY IN WATER	PHYSICAL STATE	
		99.0%	Mixed slightly	Liquid	

APPROVED EQUIPMENT:

	TANK TRUCK	TANK CAR
TANK TYPE	MC303(1), 304(2), 306(1), 307(2)	DOT 103W, 111A60W1, 111A100W1
TANK MATERIALS	Stainless steel, aluminum	Steel
INSULATION	Not required	Not required
STEAMCOILS	Not required	Not required
METHOD USED TO CLEAN TANK	Drain. Rinse with water, wash with steam, or hot water, rinse and dry.	Drain. Steam, wash with water and dry.
PUMP TYPES	Stainless steel, carbon steel Centrifugal or positive displacement	
HOSE TYPES	Teflon, Kel F, Viton, Neoprene	
GASKETS	Asbestos, Teflon, Viton (no other types rubber)	
OTHER	(1) MUST BE EQUIPPED WITH PRESSURE HATCH - 25 psig (2) PREFERRED EQUIPMENT	

HANDLING:

HOW UNLOADED	Pump or inert gas (Pressure not approved for MC 303 and 306 tanks)
PROBLEMS	FLAMMABLE: PREVENT IGNITION. GROUND AND BOND EQUIPMENT. NO SMOKING OR OPEN FLAMES. IRRITATING: PREVENT PERSONAL CONTACT. VAPOR HARMFUL: DO NOT BREATHE VAPORS.
PRECAUTIONS	USE PROTECTIVE EQUIPMENT -- MINIMUM OF CHEMICAL WORKERS GOGGLES, HARD HAT, RUBBER GLOVES AND RUBBER BOOTS. HAVE RESPIRATOR AVAILABLE.
OTHER	HER 03377

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EMERGENCY RESPONSE AND TRANSPORTATION EQUIPMENT DATA SHEET PAGE 3 OF 3

Dow Chemical U.S.A. Chemical EMERGENCY PHONE CHEMTREC 800-424-9300

Product Code: 22366

RQ

Name: DOWANOL (R) EB ETHYLENE GLYCOL BUTYL ETHER

DOT BULK HAZ CLASS: COMBUSTIBLE LIQUID , NA1993

Effective date: 09/15/92 Date Printed: 10/01/92

ERTED # 000346

TRANSPORTATION EQUIPMENT DATA

TANK TRUCK: MC 303, 306. MC 304, 307, preferred equipment.

Stainless steel, aluminum, lined steel

(NOTE: DOT 400 series may be substituted for previous MC 300 series equipment.)

TANK CAR: DOT 103W, 111A60W1, 111A100W1

Carbon steel

IMO CONTAINER:

INSULATION: Not required

STEAM COILS: Not required

PUMP TYPE: Stainless steel, carbon steel
Centrifugal or positive displacement

HOSE TYPE: Seamless stainless steel, Teflon, Viton, (Uniroyal or Goodyear), seamless bronze, seamless carbon steel

GASKETS: Teflon, Viton, Neoprene, leather (single use only)

SPECIAL REQUIREMENTS: Prevent contact with magnesium, zinc or galvanized metals. Product is hygroscopic. Prevent contact with moisture.

PRECAUTIONS: COMBUSTIBLE. Prevent ignition. Ground and bond equipment. No smoking, flares or open flames. Avoid contact with eyes, skin and clothing. Avoid breathing vapors.

DRIVER PROTECTIVE EQUIPMENT: Use protective equipment - minimum of chemical worker's goggles, hard hat, rubber gloves, and rubber boots. Have respirator available.

UNLOADING INSTRUCTIONS: Pump, gravity or inert gas.
(Pressure NOT approved for MC 303 and 306 tanks.)

CLEANING AFTER UNLOADING: Drain, flush with water, steam, wash with

The Information Herein Is Given In Good Faith, but no Warranty Express or Implied, is Made. Consult The Dow Chemical Company For Further Information

HER 03378

EMERGENCY RESPONSE INFORMATION SHEET

CAUSTIC SODA SOLUTION - 50%

(SODIUM HYDROXIDE, SODA LYE, SODIUM HYDRATE)

SODIUM HYDROXIDE - 50%

CORROSIVE
MATERIAL
UN1824
8Q

FORM: LIQUID, COLORLESS

SPECIFIC GRAVITY: 1.52

SOLUBILITY IN WATER: MIXES COMPLETELY

FREEZING POINT: 58°F

BOILING POINT: 293°F

FLASH POINT: NONE

FLAMMABLE LIMITS: NONE

VAPOR HAZARD: VERY IRRITATING
CORROSIVE.

REACTS WITH: ALUMINUM, ZINC,
COPPER TO RELEASE FLAMMABLE
HYDROGEN GAS. DILUTION WITH
CAUSES BOILING AND SPLATTERING
CONSISTENT WITH MANY ORGANICS.

HEALTH HAZARDS

ANIMAL: TOXIC. CORROSIVE. KEEP ANIMALS AWAY.

FISH: TOXIC. PREVENT ENTRY INTO NATURAL WATERS. WILL CAUSE FISH KILL.

EYES: SEVERE BURNS. POSSIBLE BLINDNESS.

SKIN: SEVERE BURNS.

INHALATION: MISTS SEVERELY IRRITATING. CAN CAUSE INJURY TO UPPER BREATH
PASSAGE.

INGESTION: CORROSIVE—CAUSES BURNS.

IN CASE OF ACCIDENT

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CORROSIVE. KEEP UPWIND. ISOLATE AREA AND DENY ENTRY. DO NOT GET IN
EYES, ON SKIN, ON CLOTHING. DO NOT BREATHE MIST IF ANY. SHUT OFF LEAK
WITHOUT RISK. MAY BE SLIPPING HAZARD. PREVENT ENTRY INTO SEWERS OR
NATURAL WATERS. USE ABSORBENT ON SMALL SPILLS AND RECOVER. DIKE LARGER
SPILLS AND RECOVER.

CAUTION: APPLYING WATER TO CAUSTIC MAY CAUSE SPLATTERING.

CLOTHING: WEAR FULL PROTECTIVE CLOTHING AND SELF-CONTAINED BREATHING
APPARATUS, IF MIST IS PRESENT.

DISPOSAL: CONTACT MANUFACTURER AND AUTHORITIES.

*RQ: SPILL OF REPORTABLE QUANTITY MUST BE REPORTED.

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CORROSIVE. WILL NOT BURN.

COOL CONTAINERS WITH WATER IF EXPOSED TO FIRE TO PREVENT BURSTING.

APPLYING WATER TO CAUSTIC MAY CAUSE SPLATTERING OF HOT CORROSIVE LIQUID.

FIRE: IN CONTACT WITH FIRE, USE FIRE EXTINGUISHING MEDIA SUITABLE FOR
THE MATERIAL WHICH IS ACTUALLY BURNING. DIKE LIQUID RUN-OFF.

PREVENT ENTRY INTO SEWERS AND/OR NATURAL WATERS.

CLOTHING: WEAR FULL PROTECTIVE CLOTHING AND SELF-CONTAINED BREATHING
APPARATUS.

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EYES: IMMEDIATE AND CONTINUOUS IRRIGATION WITH FLOWING WATER FOR AT LEAST
30 MINUTES IS IMPERATIVE. PROMPT MEDICAL CONSULTATION IS ESSENTIAL.

SKIN: IMMEDIATE, CONTINUED AND THOROUGH WASHING IN FLOWING WATER FOR 30
MINUTES IS IMPERATIVE WHILE REMOVING CONTAMINATED CLOTHING. PROMPT
MEDICAL CONSULTATION IS ESSENTIAL.

CLOTHING: REMOVE CONTAMINATED CLOTHING IMMEDIATELY AND WASH BEFORE
REUSE. DESTROY CONTAMINATED SHOES AND LEATHER ITEMS.

INHALATION: REMOVE TO FRESH AIR IF EFFECTS OCCUR. CONSULT MEDICAL
PERSONNEL.

The information contained herein is hereby presented as a summary of the information in good faith, and is to the best of The Dow Chemical Company's knowledge and belief, accurate and reliable as of the date printed, but may not be complete, or may be subject to change without notice.

HER 03379



TRANSPORTATION EQUIPMENT DATA

EMERGENCY DATA
ON OTHER SIDE

CAUSTIC SODA 50%

13216

DATE ISSUED OR REVISED
-05-20-81

CHARACTERISTICS	Sodium Hydroxide, Lye		III-11-Corrosive	
	DOT SHIPPING NAME		DOT HAZARD CLASS	
	80/Sodium Hydroxide, Solution		Corrosive Material	
	FLASH POINT	FLAMMABLE LIMITS	BOILING POINT	VAPOR DENSITY (air = 1)
	NONE		293°F	
	FREEZING POINT	LOADING TEMP.	MAX. PRODUCT TEMP.	MAX. STEAM PRESSURE
	58°F	100°F	110°F	150 psig
	WGT. SOL. = 11% (100°C)	CONCENTRATION SHIPPED	SOLUBILITY IN WATER	PHYSICAL STATE
	12.8	50%	Mixes completely	Liquid

APPROVED EQUIPMENT:

	TANK TRUCK	TANK CAR
TANK TYPE	MC 304, 307, 311, 312 NON-ALUMINUM	DOT 103W, 111A60W-1, 111A100W-1
TANK MATERIALS	Nickel clad, stainless steel, lined carbon steel	Nickel clad, lined carbon steel
INSULATION	Required to prevent freezing (1)	Required
STEAMCOILS	Required on overnight or longer hauls	Required
METHOD USED TO CLEAN TANK	Drain, flush with water, steam if not lined, wash with water and drain dry.	Drain, butterworth with hot water, rinse until cool and drain dry. Do not steam cars lined with sprayed lining.
PUMP TYPES	Air pressure, stainless steel, Ni-Resist, alloy 20. Centrifugal or positive displacement.	
HOSE TYPES	Teflon, Chem-Solv, Hypalon, Neoprene, reinforced rubber (Use only grainless nickel or nickel alloy fittings)	
GASKETS	Asbestos, Teflon, Neoprene, Rubber	
OTHER	Corrosive. Prevent contact with aluminum, steel, copper & copper alloys. (1) Not required when ambient temperature exceeds 60°F	

HANDLING:

HOW UNLOADED	Pump, air pressure
PROBLEMS	CORROSIVE. DO NOT GET IN EYES, ON SKIN, ON CLOTHING. DO NOT BREATHE SPRAY OR MIST. MAY BE SLIPPING HAZARD.
PRECAUTIONS	USE PROTECTIVE EQUIPMENT - MINIMUM OF FACE SHIELD, CHEMICAL WORKERS GOGGLES, HARD HAT, RUBBER GLOVES, BOOTS AND SLICKER SUIT.
OTHER	

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HER 03380

EMERGENCY RESPONSE INFORMATION SHEET

ORM-A
UN1710, RQ+

P.C. 56530

NEU-TRI* SOLVENT

COMPOSITION: TRICHLOROETHYLENE 95% (MIN.)

HER 03381

FORM: LIQUID, COLORLESS
SPEC GRAVITY: 1.46 @ 25/25°C
SOL IN WATER: DOES NOT MIX.
FREEZE POINT: -124°F
BOILING PT: 199°F

FLASH POINT: NONE (TCC)
FLAM LIMITS: 9.0 - 10.5% @ 25C
VAPOR HAZ: HARMFUL. WHEN HEATED,
MAY EMIT TOXIC FUMES.
REACTS WITH: ON PRESENCE OF STRONG ALKALIS
IT REACTS TO FORM A GAS WHICH CAN IGNITE
OR EXPLODE SPONTANEOUSLY.

HEALTH HAZARDS

EYES: PAIN. SLIGHT IRRITATION. POSSIBLY A BURN THAT HEALS FAST.
SKIN: SLIGHT BURN, IF CONFINED.
INHALATION: NAUSEA, DROWSINESS. UNCONSCIOUSNESS AT HIGH LEVELS.
INGESTION: LOW TOXICITY IN ANIMALS. MAY BE MODERATELY TOXIC TO HUMANS.

ANIMAL: AVOID EXPOSURE.

FISH: TOXIC. PREVENT ENTRY INTO NATURAL WATERS. WILL CAUSE FISH KILL.

IN CASE OF ACCIDENT

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VAPOR HARMFUL. KEEP UPWIND. ISOLATE AREA & DENY ENTRY. AVOID CONTACT WITH EYES, SKIN & CLOTHING. AVOID BREATHING VAPORS. VAPOR/AIR MIXTURE MAY BE FLAMMABLE. USE WATER SPRAY TO REDUCE VAPOR. NO SMOKING, FLARES, OR OPEN FLAMES. SHUT OFF IGNITION. STOP LEAK IF WITHOUT RISK. USE NONCOMBUSTIBLE ABSORBENT MATERIAL/SAND & SHOVEL INTO SUITABLE CONTAINERS. DIKE LARGER SPILLS & RECOVER. PREVENT ENTRY INTO SEWERS &/OR NATURAL WATERS.
CLOTHING: WEAR FULL PROTECTIVE CLOTHING, & SELF-CONTAINED BREATHING APPARATUS.
DISPOSAL: CONTACT MANUFACTURER & AUTHORITIES.
+RQ: SPILL OF REPORTABLE QUANTITY MUST BE REPORTED.

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VAPOR HARMFUL. VAPOR/AIR MIXTURE MAY BE FLAMMABLE. WILL BURN BUT DOES NOT IGNITE EASILY. WHEN HEATED MAY EMIT TOXIC FUMES. COOL CONTAINERS EXPOSED TO HEAT/FIRE WITH WATER TO PREVENT BURSTING.
SMALL FIRES: USE DRY CHEMICAL OR CO₂.
LARGE FIRES: USE WATER SPRAY, FOG, OR FOAM. DIKE LIQUID RUN-OFF. PREVENT ENTRY INTO SEWERS &/OR NATURAL WATERS.
CLOTHING: WEAR FULL PROTECTIVE CLOTHING & SELF-CONTAINED BREATHING APPARATUS.

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EYES: IRRIGATE WITH FLOWING WATER IMMEDIATELY & CONTINUOUSLY FOR 15 MIN. CONSULT MEDICAL PERSONNEL.
SKIN: IMMEDIATELY PLUSH WITH PLENTY OF WATER FOR AT LEAST 15 MIN WHILE REMOVING CONTAMINATED CLOTHING. CONSULT MEDICAL PERSONNEL.
CLOTHING: REMOVE CONTAMINATED CLOTHING IMMEDIATELY & WASH BEFORE REUSE. DESTROY CONTAMINATED SHOES & LEATHER ITEMS.
INHALATION: REMOVE TO FRESH AIR IF EFFECTS OCCUR. IF NOT BREATHING, GIVE MOUTH-TO-MOUTH RESUSCITATION. IF BREATHING DIFFICULT, GIVE OXYGEN. CALL A PHYSICIAN.

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TRANSPORTATION EQUIPMENT DATA

EMERGENCY DATA
ON OTHER SIDE

PRODUCT HEU-TRI* SOLVENT		CODE NO. 56530		DATE REVISION OR REVISED OCT 01 1982	
SYNOPSIS: TRICHLOROETHYLENE			TYPE COMMODITY SOLVENT		
CHARACTERISTICS	DOT SHIPPING NAME RQ/TRICHLOROETHYLENE		DOT HAZARD CLASS ORM-A		
	FLASH POINT NONE	FLAMMABLE LIMITS 9.0 - 10.5 @ 25°C	BOILING POINT 199°F		VAPOR DENSITY (AIR = 1) 4.53
	FREEZING POINT -124°F	LOADING TEMP. AMBIENT	MAX. PRODUCT TEMP. --		MAX. STEAM PRESSURE --
	WT/LAL @ 20°F (20°C) 12.263	CONCENTRATION SHIPPED FULL STRENGTH	SOLUBILITY IN WATER DOES NOT MIX		PHYSICAL STATE LIQUID

APPROVED EQUIPMENT:

	TANK TRUCK	TANK CAR
TANK TYPE:	MC 303(1), 304(2), 306(1), 307(2), 311(2), 312(2)	DOT 103W, 111A60W1, 111A100W1
TANK MATERIALS:	STAINLESS STEEL, ALUMINUM	PLASITE LINED 3066, AMERCOAT 75, OR PHENOFLEX 957
INSULATION:	NOT REQUIRED	NOT REQUIRED
STEAMCOILS:	NOT REQUIRED	NOT REQUIRED
METHOD USED TO CLEAN TANK:	FLUSH WITH WATER, STEAM, WASH WITH WATER, AND DRY.	
PUMP TYPES:	STAINLESS STEEL, CARBON STEEL CENTRIFUGAL OR POSITIVE DISPLACEMENT	
HOSE TYPES:	SEAMLESS STAINLESS STEEL, TEFLON, SEAMLESS STEEL, SEAMLESS BRONZE, CROSS LINKED P/E (3), VITON (3), (GOODYEAR OR UNIROYL)	
GASKETS:	TEFLON, ASBESTOS, VITON, NEOPRENE LEATHER (SINGLE USE ONLY)	
OTHER:	(1) MUST BE EQUIPPED WITH PRESSURE HATCH - 25 PSIG MIN. (2) PREFERRED EQUIPMENT AVOID CONTACT WITH RUBBER, PLASTICS & MAGNESIUM OR POT METAL ALLOYS.	

HANDLING:

HOW UNLOADED:	PUMP, INERT GAS PRESSURE (DRY) (PRESSURE NOT APPROVED FOR MC 303 & 306 TANKS)
PROBLEMS:	VAPOR HARMFUL. AVOID CONTACT WITH EYES, SKIN & CLOTHING. AVOID BREATHING VAPORS. VAPOR/AIR MIXTURE MAY BE FLAMMABLE.
PRECAUTIONS:	USE PROTECTIVE EQUIPMENT--MINIMUM OF CHEMICAL WORKERS GOGGLES, HARD HAT, RUBBER GLOVES & RUBBER BOOTS. HAVE RESPIRATOR AVAILABLE.
OTHER:	(3) MAY BE USED ONLY FOR INTERMITTENT SERVICE. DO NOT USE IN PERMANENT INSTALLATIONS. IF HOSE IS FLUSHED BEFORE SHIPMENT, IT MUST ALSO BE DRIED PRIOR TO SHIPMENT.
*TRADEMARK OF THE DOW CHEMICAL COMPANY	
HER 03382	

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(4-202-483-7616 OUTSIDE THE CONTINENTAL U.S. AND IN WASHINGTON, D.C.)

EMERGENCY RESPONSE INFORMATION SHEET

DOT

FLAMMABLE
LIQUID
UN1184
RQ*

ETHYLENE DICHLORIDE

(1,2-DICHLOROETHANE; SYM-DICHLOROETHANE; ETHYLENE CHLORIDE)

ETHYLENE DICHLORIDE, MIN. 99.5%

FORM: LIQUID, COLORLESS

SPECIFIC GRAVITY: 1.25

SOLUBILITY IN WATER: MIXES SLIGHTLY

FREEZING POINT: -32°F

BOILING POINT: 182°F

FLASH POINT: 56°F (TCC)

FLAMMABLE LIMITS: 6.2%-16%

VAPOR HAZARD: FLAMMABLE, IRRITATING.

REACTS WITH: BASE AND OXIDIZING

MATERIALS. WHEN BURNING, DECOMPOSES

& GIVES OFF HIGHLY CORROSIVE &

TOXIC GASES.

HEALTH HAZARDS

ANIMAL: AVOID INGESTION. AVOID EXPOSURE.

FISH: TOXIC. PREVENT ENTRY INTO NATURAL WATERS. WILL CAUSE FISH KILL.

EYES: MODERATE IRRITATION. A BURN THAT HEALS FAST.

SKIN: IRRITATION, EVEN SLIGHT BURN. MAY BE ABSORBED IN TOXIC AMOUNTS UPON CROSS CONTACT.

INHALATION: INTERNAL INJURY, DROWSINESS, NAUSEA. VAPORS IRRITATING.

INGESTION: MODERATELY TOXIC.

IN CASE OF ACCIDENT

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FLAMMABLE. IRRITATING. KEEP UPWIND. ISOLATE AREA AND DENY ENTRY. AVOID CONTACT WITH EYES, SKIN AND CLOTHING. DO NOT BREATHE VAPORS. USE WATER SPRAY TO REDUCE VAPOR. NO SMOKING, FLAMES, OR OPEN FLAMES. SHUT OFF IGNITION AND LEAK IF WITHOUT RISK. USE NONCOMBUSTIBLE ABSORBENT MATERIAL/SAND AND SHOVEL INTO SUITABLE CONTAINERS. DIKE LARGER SPILLS AND RECOVER. PREVENT ENTRY INTO SEWERS AND/OR NATURAL WATERS.

CLOTHING: WEAR FULL PROTECTIVE CLOTHING AND SELF-CONTAINED BREATHING APPARATUS.

DISPOSAL: CONTACT MANUFACTURER AND AUTHORITIES.

*RQ: SPILL OF REPORTABLE QUANTITY MUST BE REPORTED.

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FLAMMABLE. IRRITATING.

MAY DECOMPOSE IN HEAT/FIRE RELEASING PRODUCTS OF GREATER HAZARD.

DO NOT PUT OUT ANY FIRES AT VENTS UNTIL LEAK IS SHUT OFF.

SMALL FIRES: USE DRY CHEMICAL OR CO₂.

LARGE FIRES: USE WATER SPRAY, FOG, OR FOAM.

IF MASSIVE FIRE: USE UNMANNED HOSE HOLDER OR MONITOR NOZZLES. IF THIS IS IMPOSSIBLE, WITHDRAW FROM AREA AND LET FIRE BURN.

DIKE LIQUID RUN-OFF. PREVENT ENTRY INTO SEWERS AND/OR NATURAL WATERS.

CLOTHING: WEAR FULL PROTECTIVE CLOTHING AND SELF-CONTAINED BREATHING APPARATUS.

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EYES: IRRIGATE WITH FLOWING WATER IMMEDIATELY AND CONTINUOUSLY FOR 15 MINUTES. CONSULT MEDICAL PERSONNEL.

SKIN: IMMEDIATELY FLUSH WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES WHILE REMOVING CONTAMINATED CLOTHING. CONSULT MEDICAL PERSONNEL.

CLOTHING: REMOVE CONTAMINATED CLOTHING IMMEDIATELY AND WASH BEFORE REUSE. DESTROY CONTAMINATED SHOES AND LEATHER ITEMS.

INHALATION: REMOVE TO FRESH AIR IF EFFECTS OCCUR. IF NOT BREATHING, GIVE MOUTH-TO-MOUTH RESUSCITATION. IF BREATHING DIFFICULT, GIVE OXYGEN. CALL A PHYSICIAN.

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TRANSPORTATION EQUIPMENT DATA

- EMERGENCY DATA
ON OTHER SIDE -

ETHYLENE DICHLORIDE		CODE NO.	30457	DATE ISSUED OR REVISED	03-22-82
1,2-Dichloroethane		TYPE COMMODITY			
DOT SHIPPING NAME		Solvent			
CHARACTERISTICS	DOT SHIPPING NAME		DOT HAZARD CLASS		
	RQ/ETHYLENE DICHLORIDE		FLAMMABLE LIQUID		
	FLASH POINT	FLAMMABLE LIMITS	BOILING POINT	VAPOR DENSITY (air = 1)	
	56°F (TCC)	6.2-16%	182°F	3.42	
CHARACTERISTICS	FREEZING POINT	LOADING TEMP.	MAX. PRODUCT TEMP.	MAX. STEAM PRESSURE	
	-32°F	Ambient	--	--	
	WT/GAL @ 55°F (15°C)	CONCENTRATION SHIPPED	SOLUBILITY IN WATER	PHYSICAL STATE	
	10.500	Full strength	Mixes slightly	Liquid	

APPROVED EQUIPMENT:

	TANK TRUCK	TANK CAR
TANK TYPE	MC 303(1), 304(2), 306(1), 307(2)(3) NON-ALUMINUM	DOT 103W, 111A60W-1, 111A100W-1
TANK MATERIALS	Stainless steel, lined steel	Carbon steel
INSULATION	Not required	Not required
STEAMCOILS	Not required	Not required
METHOD USED TO CLEAN TANK	Drain, flush with water, steam, rinse and dry.	Drain, rinse with water, steam, wash with water and dry.
PUMP TYPES	Stainless steel, carbon steel Centrifugal or positive displacement	
HOSE TYPES	Seamless stainless steel, Teflon, seamless bronze, seamless steel, cross-linked P/E(4), Viton(4)	
GASKETS	Asbestos, Teflon, Viton, neoprene (leather - single use only).	
OTHER	(1) MUST BE EQUIPPED WITH PRESSURE HATCH - 25 PSIG MIN. (2) PREFERRED EQUIPMENT. (3) TEXAS DIVISION REQUIRES UNITS TO BE EQUIPPED WITH VENT FOR CLOSED LOADING WHICH CAN BE OPERATED FROM GROUND LEVEL.	

HANDLING:

HOW UNLOADED	Pump or inert gas pressure. (Pressure NOT approved for MC 303 and 306 tanks.)
PROBLEMS	FLAMMABLE. PREVENT IGNITION. GROUND AND BOND EQUIPMENT. NO SMOKING OR OPEN FLAMES. IRRITATING. AVOID CONTACT WITH EYES, SKIN AND CLOTHING. DO NOT BREATHE VAPORS.
PRECAUTIONS	USE PROTECTIVE EQUIPMENT - MINIMUM OF CHEMICAL WORKERS GOGGLES, HARD HAT, RUBBER GLOVES AND RUBBER BOOTS. HAVE RESPIRATOR AVAILABLE.
OTHER	(4) MAY BE USED ONLY FOR INTERMITTENT SERVICE. DO NOT USE IN PERMANENT INSTALLATIONS.

HER 03384

FOR CHEMICAL EMERGENCY - CALL 1-800-24-9300 IN THE U.S.A.
(1-800-483-7616 OUTSIDE THE CONTINENTAL U.S. AND IN WASHINGTON, D.C.)
EMERGENCY RESPONSE INFORMATION SHEET

PRODUCT: **PIPERYLENE CONCENTRATE**

DOT **FLAMMABLE LIQUID UN1923 RQ**

COMPOSITION: **PIPERYLENE-55X; CYCLOPENTENE-32X; ISOPRENE-5X; CYCLOPENTADIENE-3Z;
5 PARAFINS & MONO-OLEFINS-5Z**

PHYSICAL PROPERTIES: **FORM: LIQUID**
SPECIFIC GRAVITY: 0.68
SOLUBILITY IN WATER: DOES NOT MIX
FREEZING POINT: -112°F
FLASH POINT: LESS THAN 4°F.
FLAMMABLE LIQUID: 1.0X - 7Z
VAPOR HAZARD: FLAMMABLE.
IRRITATING.
BOILING POINT: 104°F (40°C)
REACTS WITH: ACID, OXIDIZING
POLYMERIZATION CATALYST

HEALTH HAZARDS

ENVIRONMENT: **ANIMAL: AVOID INGESTION**
FISH: NO DATA-POSSIBLY TOXIC. AVOID ENTRY INTO NATURAL WATERS.
MAY CAUSE LOCALIZED FISH KILL.

EXPOSURE: **EYES: SLIGHT IRRITATION**
SKIN: CAUSES IRRITATION; POSSIBLE MILD BURN IF CONFINED TO SKIN.
INHALATION: IRRITATING TO RESPIRATORY PASSAGES. CAN CAUSE ANESTHESIA.
INGESTION: LOW TOXICITY.

IN CASE OF ACCIDENT

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FLAMMABLE. IRRITATING. KEEP UPWIND. ISOLATE AREA AND DENY ENTRY.
AVOID CONTACT WITH EYES, SKIN AND CLOTHING. AVOID BREATHING VAPORS.
NO SMOKING, FLARES, OR OPEN FLAMES. SHUT OFF IGNITION AND LEAK IF WITH
RISK. USE WATER SPRAY TO REDUCE VAPOR. USE NONCOMBUSTIBLE ABSORBENT
MATERIAL/SAND AND SHOVEL INTO SUITABLE CONTAINERS. DIKE LARGER SPILLS
AND RECOVER. PREVENT ENTRY INTO SEWERS AND/OR NATURAL WATERS.
CLOTHING: WEAR FULL PROTECTIVE CLOTHING AND SELF-CONTAINED BREATHING
APPARATUS.
DISPOSAL: CONTACT MANUFACTURER AND AUTHORITIES.

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FLAMMABLE. IRRITATING.
DO NOT PUT OUT ANY FIRES AT VENTS UNTIL LEAK IS SHUT OFF.
MAY POLYMERIZE IN HEAT/FIRE.
COOL CONTAINERS EXPOSED TO HEAT/FIRE WITH WATER TO PREVENT BURSTING.
SMALL FIRES: USE DRY CHEMICAL OR CO₂.
LARGE FIRES: USE WATER SPRAY, FOG, OR FOAM. IF MASSIVE FIRE: USE
UNMANNED HOSE HOLDER OR MONITOR NOZZLES. IF THIS IS IMPOSSIBLE, WITHDRAW
FROM AREA AND LET FIRE BURN. DIKE LIQUID RUN-OFF.
PREVENT ENTRY INTO SEWERS AND/OR NATURAL WATERS.

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CLOTHING: WEAR FULL PROTECTIVE CLOTHING AND SELF-CONTAINED BREATHING
APPARATUS.
EYES: IRRIGATION IMMEDIATELY WITH WATER FOR 5 MINUTES IS GOOD SAFETY
PRACTICE.
SKIN: IMMEDIATELY FLUSH WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES
WHILE REMOVING CONTAMINATED CLOTHING. CONSULT MEDICAL PERSONNEL.
CLOTHING: REMOVE CONTAMINATED CLOTHING IMMEDIATELY AND WASH BEFORE
REUSE. DESTROY CONTAMINATED SHOES AND LEATHER ITEMS. CLOTHING MAY BE A
FIRE HAZARD UNTIL CLEANED.
INHALATION: REMOVE TO FRESH AIR IF EFFECTS OCCUR. IF NOT BREATHING,

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DOW CHEMICAL U.S.A.

03-22-52

TRANSPORTATION EQUIPMENT DATA

EMERGENCY DATA
ON OTHER SIDE

POLYPERYLENE CONCENTRATE		LOT NO. 60719	DATE ISSUED 03-22-82
CHARACTERISTICS	DOT SHIPPING NAME RQ/FLAMMABLE LIQUID N.O.S.		TYPE COMMODITY Resin Forming Feedstock
	FLASH POINT Less than 4°F		DOT HAZARD CLASS FLAMMABLE LIQUID
	FLAMMABLE LIMITS 1-7.0%	BOILING POINT 104°F (40°C)	VAPOR DENSITY (AIR = 1) 2.4
	FREELING POINT -112°F	LOADING TEMP. Ambient	MAX. PRODUCT TEMP. --
	WT/GAL @ 77°F (25°C) 5.89	CONCENTRATION SHIPPED Full strength	SOLUBILITY IN WATER Does not mix
		PHYSICAL STATE Liquid	

APPROVED EQUIPMENT:

	TANK TRUCK	TANK CAR
TANK TYPE:	MC 304, 307, 330, 331	DOT 111A100W-1, 105A100W, 112A340W
TANK MATERIALS:	Stainless steel, aluminum, lined steel	Aluminum, lined steel, carbon steel
INSULATION:	Not required	Not required
STEAMCOILS:	Not required	Not required
METHOD USED TO CLEAN TANK:	Drain, rinse with water, steam, wash with detergent, rinse with water and dry.	Rinse, steam, rinse and dry. (Boil with 10% caustic soda solution if necessary.)
PUMP TYPES:	Carbon steel, stainless steel Centrifugal or positive displacement	
HOSE TYPES:	Seamless stainless steel (recommended), seamless bronze.	
GASKETS:	Teflon, asbestos with outer compression ring, spiral wound stainless steel.	
OTHER:		

HANDLING:

HOW UNLOADED:	Pump or inert gas pressure.
PROBLEMS:	FLAMMABLE. PREVENT IGNITION. GROUND AND BOND EQUIPMENT. NO SMOKING OR OPEN FLAMES. IRRITATING. AVOID CONTACT WITH EYES, SKIN AND CLOTHING. AVOID BREATHING VAPORS.
PRECAUTIONS:	USE PROTECTIVE EQUIPMENT - MINIMUM OF CHEMICAL WORKERS GOGGLES, HARD HAT, RUBBER GLOVES, RUBBER BOOTS. HAVE RESPIRATOR AVAILABLE.
OTHER:	

HER 03386

Dow Chemical U.S.A. Chemical EMERGENCY PHONE CHEMTREC 800-424-9300

Product Code: 18364

RQ

Name: CUMENE

DOT BULK HAZ CLASS: NA1993

Effective date: 01/19/88 Date Printed: 01/05/89

ERTED # 000481

EMERGENCY RESPONSE INFORMATION

PRECAUTIONS AND PROTECTIVE EQUIPMENT

COMBUSTIBLE. Keep upwind. Isolate area and deny entry. Avoid contact with eyes, skin and clothing. Avoid breathing vapors. Use water spray to reduce vapor. No smoking, flares, or open flames.

CLOTHING: For SPILL/LEAK and FIRE, wear full protective clothing and self-contained breathing apparatus.

HEALTH HAZARDS:

EYES: Slight irritation.

SKIN: Slight irritation.

INHALATION: Pain. Drowsiness. Has offensive odor.

INGESTION: Low toxicity.

FIRST AID:

EYES: Irrigation immediately with water for 5 minutes is good safety practice.

SKIN: Immediately flush with plenty of water for at least 15 minutes while removing contaminated clothing. Consult medical personnel.

CLOTHING: Remove contaminated clothing and air thoroughly before reuse. Clothing may be a fire hazard until cleaned.

INHALATION: Remove to fresh air if effects occur. If not breathing, give mouth-to-mouth resuscitation. If breathing difficult, give oxygen. Call a physician.

LEAK / SPILL:

Shut off ignition and leak if without risk. Use noncombustible absorbent material/sand and shovel into suitable containers. Dike larger spills and recover. Prevent entry into sewers and/or natural waters.

Avoid ingestion and exposure to animals.

Toxic to fish. Will cause fish kill.

DISPOSAL: Contact manufacturer and authorities.

FIRE:

COMBUSTIBLE. Do not put out any fires at vents until leak is shut off. Cool containers exposed to heat/fire with water to prevent bursting.

SMALL FIRES: Use dry chemical or CO2.

LARGE FIRES: Use water spray, fog, or foam.

MASSIVE FIRES: Use unmanned hose holder or monitor nozzles. If this is impossible, withdraw from area and let fire burn. Dike liquid runoff. Prevent entry into sewers and/or natural waters.

(R) Indicates a Trademark of The Dow Chemical Company

HER 03387

Dow Chemical U.S.A. Chemical EMERGENCY PHONE CHEMTREC 800-424-9300

Product Code: 19364 RQ
Name: CUMENE
DOT BULK HAZ CLASS: HAZ993
Effective date: 01/19/98 Date Printed: 01/05/99 ERTED # 000481

COMPOSITION AND PRODUCT CHARACTERISTICS

COMPOSITION: Isopropylbenzene 99.9%

PHYSICAL STATE AND APPEARANCE: Lq., colorless

SOLUBILITY IN WATER: Does not mix

FLASH PT: 111 F (TC)

LOWER FLAM LIMIT: 0.9%

UPPER FLAM LIMIT: 6.5%

IGNITION TEMPERATURE: Not determined

BOILING PT: 305 F

FREEZING PT: -145.8 F

SPECIFIC GRAVITY: 0.9 @ 20/20 C

WGT/GAL @ 72 DEG F: 7.04

AIR DENSITY (AIR @ 70): 4.1

VAPOR PRESSURE @ 70 DEG F: Not determined

VAPOR PRESSURE @ 100 DEG F: Not determined

COEFF OF THERMAL EXPANSION: Not determined

LOADING TEMPERATURE: Ambient to 90 F

MAXIMUM PRODUCT TEMPERATURE: --

MAXIMUM STEAM PRESSURE: --

RQ indicates a Trademark of The Dow Chemical Company

Dow Chemical U.S.A. Chemical EMERGENCY PHONE CHEMTREC 800-424-9300

Product Code: 19364 RQ
Name: CUMENE
DOT BULK HAZ CLASS: HAZ993
Effective date: 01/19/98 Date Printed: 01/05/99 ERTED # 000481

TRANSPORTATION EQUIPMENT DATA

TANK TRUCK: MC 301, 304, must be equipped with pressure hatch (25 psig min.)

MC 304, 307, preferred equipment
Stainless steel

TANK CAR: DOT 101W, 111A40W1, 111A10W1
Carbon steel

IMO CONTAINER: 4

INSULATION: Not required

STEAM COILS: Not required

PUMP TYPE: Steel, stainless steel
Centrifugal or positive displacement

HOSE TYPE: Aluminum, stainless steel, Teflon, cross-linked P/E,
Viton

*For intermittent service only, drain hose after each use.

GASKETS: Asbestos, Teflon, Viton, Neoprene

SPECIAL REQUIREMENTS:

PRECAUTIONS: COMBUSTIBLE. Prevent ignition. Ground and bond equipment. No smoking or open flames.
Avoid breathing vapors. Avoid contact with eyes, skin and clothing.

DRIVER PROTECTIVE EQUIPMENT: Use protective equipment - minimum of chemical worker's goggles, hard hat, rubber gloves and rubber boots. Have respirator available.

UNLOADING INSTRUCTIONS: Pump or inert gas.
(Pressure NOT approved for MC 301 and 304 tanks.)

CLEANING AFTER UNLOADING: Drain, rinse, wash with detergent, rinse and dry.

The Information Herein Is Given In Good Faith, But No Warranty, Express Or Implied, Is Made. Consult The Dow Chemical Company For Further Information.

HER 03388

FOR CHEMICAL EMERGENCY - CALL 1-800-424-9300 IN THE U.S.A.
(1-202-483-7616 OUTSIDE THE CONTINENTAL U.S. AND IN WASHINGTON, D.C.)
EMERGENCY RESPONSE INFORMATION SHEET

ORM-A
UN1593

P.C. 55590 METHYLENE CHLORIDE TECH

COMPOSITION:

FORM: WATER-WHITE LIQUID
SPEC GRAVITY: 1.320 @ 25/25C
SOL IN WATER: DOES NOT MIX
FREEZE POINT: -142.6°F
BOILING PT: 104°F

FLASH POINT: NONE/TCC
FLAM LIMITS: 14.9 - 22% @ 25C
VAPOR HAZ: HARMFUL
REACTS WITH: ALUMINUM, MAGNESIUM OR
THEIR ALLOYS AND POT METAL.

HEALTH HAZARDS

EYES: PAIN. MODERATE IRRITATION. SLIGHT BURN.
SKIN: PROLONGED CONTACT: MODERATE IRRITATION. IF CONFINED, SLIGHT BURN.
INHALATION: MAY CAUSE DROWSINESS & UNCONSCIOUSNESS.
INGESTION: LOW TOXICITY.

ANIMAL: AVOID INGESTION & EXPOSURE.
FISH: AVOID ENTRY INTO NATURAL WATERS. MAY CAUSE LOCALIZED FISH KILL.

IN CASE OF ACCIDENT

SPILL

VAPOR HARMFUL. KEEP UPWIND. ISOLATE AREA & DENY ENTRY. AVOID CONTACT WITH EYES, SKIN & CLOTHING. AVOID BREATHING VAPORS. USE WATER SPRAY TO REDUCE VAPOR. VAPOR/AIR MIXTURE MAY BE FLAMMABLE. NO SMOKING, FLARES, OR OPEN FLAMES. SHUT OFF IGNITION. STOP LEAK IF WITHOUT RISK. USE NONCOMBUSTIBLE ABSORBENT MATERIAL/SAND & SHOVEL INTO SUITABLE CONTAINERS. DIKE LARGER SPILLS & RECOVER. AVOID ENTRY INTO SEWERS &/OR NATURAL WATERS.
CLOTHING: WEAR FULL PROTECTIVE CLOTHING, & SELF-CONTAINED BREATHING APPARATUS.
DISPOSAL: CONTACT MANUFACTURER & AUTHORITIES.

RELEASE

VAPOR HARMFUL. WILL BURN BUT DOES NOT IGNITE EASILY. VAPOR/AIR MIXTURE MAY BE FLAMMABLE. MAY DECOMPOSE IN HEAT/FIRE RELEASING PRODUCTS OF GREATER HAZARD. COOL CONTAINERS EXPOSED TO HEAT/FIRE WITH WATER TO PREVENT BURSTING.
SMALL FIRES: USE DRY CHEMICAL OR CO₂.
LARGE FIRES: USE WATER SPRAY, FOG, OR FOAM. DIKE LIQUID RUN-OFF. AVOID ENTRY INTO SEWERS &/OR NATURAL WATERS.
CLOTHING: WEAR FULL PROTECTIVE CLOTHING & SELF-CONTAINED BREATHING APPARATUS.

FIRST AID

EYES: IRRIGATE WITH FLOWING WATER IMMEDIATELY & CONTINUOUSLY FOR 15 MIN. CONSULT MEDICAL PERSONNEL.
SKIN: WASH OFF IN FLOWING WATER OR SHOWER.
CLOTHING: REMOVE CONTAMINATED CLOTHING & WASH BEFORE REUSE.
INHALATION: REMOVE TO FRESH AIR IF EFFECTS OCCUR. IF NOT BREATHING, GIVE MOUTH-TO-MOUTH RESUSCITATION. IF BREATHING DIFFICULT, GIVE OXYGEN. CALL A PHYSICIAN.

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FORM C-2000 PRINTED 6-8-82



DOW CHEMICAL U.S.A.

An authorized unit of The Dow Chemical Company

Trademark of The Dow Chemical Company

JAN 14 1983

HER 03389

December 31, 1990



Material Safety Data Sheet

CYCLOHEXANE (98%, 99.5%, 99.8%, Research Grade, Spectro Grade)

PHILLIPS 66 COMPANY
A Subsidiary of Phillips Petroleum Company
Bartlesville, Oklahoma 74004

PHONE NUMBERS
Emergency:
Business Hours (918) 661-3865
After Hours (918) 661-8110
General MSDS Information:
(918) 661-8327

A. Product Identification

Synonyms: Borger Refinery Stream No. 657; Swoeny Refinery Unit 19 Cyclohexane Product; Puerto Rico Core Stream No. 3216; Unit 3.2 Stabilizer Column Bottoms (Puerto Rico Core)

Chemical Name: Cyclohexane
Chemical Family: Cycloparaffinic Hydrocarbon
Chemical Formula: C₆H₁₂
CAS Reg. No.: 110-82-7
Product No.: N249, N24500, N24842

Product and/or Components Entered on EPA's TSCA Inventory: YES

This product is in U.S. commerce, and is listed in the Toxic Substances Control Act (TSCA) Inventory of Chemicals; hence, it is subject to all applicable provisions and restrictions of 40 CFR, section 721 and 723.250.

B. Hazardous Components

Ingredients	CAS Number	% By Wt.	OSHA PEL	ACGIH TLV
Cyclohexane	110-82-7	X	300 ppm	300 ppm

X See Section N for additional product composition information.

HER 03391

NA - Not Applicable NE - Not Established

C. Personal Protection Information

Ventilation: Use adequate ventilation to control exposure below recommended levels.

Respiratory Protection: For concentrations exceeding the recommended exposure level, use NIOSH/MSHA approved air purifying respirator. In case of spill or leak resulting in unknown concentration, use NIOSH/MSHA approved supplied air respirator. If conditions immediately dangerous to life or health (IDLH) exist, use NIOSH/MSHA approved self-contained breathing apparatus (SCBA).

Eye Protection: Use safety glasses with side shields.

Skin Protection: Wear polyvinyl alcohol or Duna-N gloves. Use full-body, long sleeved garments to prevent skin contact.

NOTE: Personal protection information shown in Section C is based upon general information as to normal uses and conditions. Where special or unusual uses or conditions exist, it is suggested that the expert assistance of an industrial hygienist or other qualified professional be sought.

D. Handling and Storage Precautions

Avoid inhalation and skin and eye contact. Wear protective equipment and/or garments described in Section C if exposure conditions warrant. Wash thoroughly after handling. Provide means of controlling leaks and spills. Immediately remove and launder contaminated clothing before reuse.

Store in a cool, well-ventilated area away from ignition sources. Provide means of controlling leaks and spills. Bond and ground during liquid transfer. Keep containers closed.

E. Reactivity Data

Stability: Stable

Conditions to Avoid: Not Applicable

Incompatibility (Materials to Avoid): Oxygen and strong oxidizing materials

Hazardous Polymerization: Will Not Occur

Hazardous Decomposition Products: Carbon oxides and various hydrocarbons formed when burned.

F. Health Hazard Data

Recommended Exposure Limits:

See Section B.

HER 03392

Acute Effects of Overexposure:

- Eye:** Contact with the liquid or high vapor concentrations may cause mild eye irritation including redness, swelling of mucous membranes and tearing.
- Skin:** Nominal skin absorption. May defat skin upon repeated or prolonged contact resulting in redness, swelling, pain or thickening. Prolonged exposure to high vapor concentrations may cause a mild mucous membrane irritation.
- Inhalation:** High vapor concentrations may cause dizziness, excitement, hyperactivity, rapid breathing, difficulty breathing, fatigue, headache, incoordination, tremors, nausea and respiratory irritation. Extreme exposures may cause anesthesia, unconsciousness and death.
- Ingestion:** May cause increased respiration rate, fatigue, diarrhea, nausea and central nervous system depression. Extreme exposure may cause circulatory collapse and death. May be aspirated into lungs if swallowed, resulting in pulmonary edema and chemical pneumonitis.

Subchronic and Chronic Effects of Overexposure:

No known applicable information.

Other Health Effects:

No known applicable information.

Health Hazard Categories:

	Animal	Human		Animal	Human
Known Carcinogen	—	—	Toxic	—	—
Suspect Carcinogen	—	—	Corrosive	—	—
Mutagen	—	—	Irritant	—	—
Teratogen	—	—	Target Organ Toxin	X	X
Allergic Sensitizer	—	—	Specify - Lung - Aspiration Hazard		
Highly Toxic	—	—			

First Aid and Emergency Procedures:

- Eye:** Flush eyes with water.
- Skin:** Flush skin with water for fifteen minutes.
- Inhalation:** Remove from exposure. If breathing is difficult, give oxygen and seek medical attention.
- Ingestion:** Do not induce vomiting. Seek immediate medical assistance.
- Note to Physician:** Gastric lavage using a cuffed endotracheal tube may be performed at your discretion.

HER 03393

G. Physical Data

Appearance: Colorless Liquid
Odor: Pungent
Boiling Point: Approx. 177F (81C)
Vapor Pressure: 3.2 psia (165 mm Hg) at 100F
Vapor Density (Air = 1): 2.8
Solubility in Water: Negligible
Specific Gravity (H2O = 1): 0.77 at 60/60F
Percent Volatile by Volume: 100
Evaporation Rate (Butyl Acetate = 1): >1
Viscosity: Not Established

H. Fire and Explosion Data

Flash Point: -100F (-73C)
Fire Point: -100F (-73C)
Explosion Limits: 1.5% - 10.5%
Special Fire Fighting Procedures: Evacuate area if fire is out of control.

Water spray may be used to cool exposed containers and equipment. Do not spray water directly on fire - product will float and could be reignited on surface of water.

Fire and Explosion Hazards: Carbon oxides and various hydrocarbons formed when burned. Highly flammable vapors which are heavier than air may accumulate in low areas and/or spread along ground away from handling site. Flash back along vapor trail is possible.

I. Spill, Leak and Disposal Procedures

Precautions Required if Material is Released or Spilled:

Evacuate area of all unnecessary personnel. In case of spill or leak resulting in unknown concentration, use NIOSH/MSHA approved supplied air respirator. In case of spill or leak which results in conditions immediately dangerous to life or health (IDLH) use NIOSH/MSHA approved self-contained breathing apparatus (SCBA) equipment. When entry into or exit from concentrations of unknown exposure, use NIOSH/MSHA approved self-contained breathing apparatus (SCBA). Shut off source, if possible and contain spill. Protect from ignition. Keep out of water sources and sewers. Absorb in

HER 03394

J. DOT Transportation

Shipping Name: Cyclohexane
Hazard Class: Flammable Liquid
ID Number: UN 1145
Markings: Cyclohexane/UN 1145
Label: Flammable Liquid
Placard: Flammable/1145
Hazardous Substance/RQ: Not Applicable
Shipping Description: Cyclohexane, Flammable Liquid, UN 1145
Packaging References: 49 CFR 173.118 and 173.119(a)

K. RCRA Classification - Unadulterated Product as a Waste

U056-Cyclohexane; Ignitable

Wear protective equipment and/or garments described in Section C if exposure conditions warrant. Use NIOSH/MSHA approved respiratory protection, such as air-supplied mask, in confined spaces.

M. Hazard Classification

☒ This product meets the following hazard definition(s) as defined by the Occupational Safety and Health Hazard Communication Standard (29 CFR Section 1910.1200):

<input type="checkbox"/> Combustible Liquid	<input type="checkbox"/> Flammable Aerosol	<input type="checkbox"/> Oxidizer
<input type="checkbox"/> Compressed Gas	<input type="checkbox"/> Explosive	<input type="checkbox"/> Pyrophoric
<input type="checkbox"/> Flammable Gas	<input checked="" type="checkbox"/> Health Hazard (Section F)	<input type="checkbox"/> Unstable
<input checked="" type="checkbox"/> Flammable Liquid	<input type="checkbox"/> Organic Peroxide	<input type="checkbox"/> Water Reactive
<input type="checkbox"/> Flammable Solid		

☐ Based on information presently available, this product does not meet any of the hazard definitions of 29 CFR Section 1910.1200.

HER 03395

N. Additional Comments

Additional Product Composition Information:

	Ingredient	% By Wt.
98.0%	Cyclohexane	98.7
	Methylcyclopentane	0.0
	Methylhexanes	0.3
	Dimethylpentane	0.2
99.5%	Cyclohexane	99.8
	Related Hydrocarbons	0.2
99.8%	Cyclohexane	99.9
	Related Hydrocarbons	0.1

This product contains the following chemical or chemicals subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372. (See Section B):

Cyclohexane

HER 03396

THIS DOCUMENT IS UNCLASSIFIED, EXCEPT WHERE SHOWN OTHERWISE. IT IS SUBJECT TO A PATENT AND TRADE SECRET REVIEW. THE REVIEWED DOCUMENT RELATES ONLY TO THE SPECIFIC PRODUCT DESIGNATED AND MAY NOT BE VALID WHERE SUCH PRODUCT IS SOLD OR UTILIZED WITHIN THE UNITED STATES. FURTHER, WHEN THE CONDITIONS AND METHODS OF USE OF THE PRODUCT AND INFORMATION RELAYED TO HEREIN ARE BEYOND THE CONTROL OF PATENTS, CHANGE IN THE PATENT STATUS OF ANY AND ALL INTELLECTUAL PROPERTY RIGHTS OR FROM ANY USE OF THE PRODUCT OR SUCH INFORMATION, THE STATEMENT MADE HEREIN SHALL BE CONSIDERED AS A STATEMENT OF INFORMATION FOR THE USE OF ANY PRODUCT IN A MANNER THAT MIGHT VIOLATE EXISTING PATENTS.



USA and WORLDWIDE

May 1, 1989

Material Safety Data Sheet

DEBUTANIZED AROMATIC CONCENTRATE

PHILLIPS 66 COMPANY
A Subsidiary of Phillips Petroleum Company
Bartlesville, Oklahoma 74004

PHONE NUMBERS
Emergency: _____
Business Hours (918) 661-3865
After Hours (918) 661-8118
General MSDS Information: _____
(918) 661-8327

A. Product Identification

Synonyms: DAC
Chemical Name: Mixture
Chemical Family: Hydrocarbon
Chemical Formula: Mixture
CAS Reg. No.: Mixture
Product No.: Not Established

Product and/or Components Entered on EPA's TSCA Inventory: YES

This product has been commercially introduced into U.S. commerce, and is listed in the Toxic Substances Control Act (TSCA) Inventory of Chemicals in Commerce; hence, it is subject to all applicable provisions and restrictions under TSCA 40 CFR, section 721 and 723.250.

B. Hazardous Components

Ingredients	CAS Number	% By Wt.	OSHA PEL	ACGIH TLV
C4 Hydrocarbons	Various	0-10	800 ppm*	800 ppm*
C5 Hydrocarbons	Various	10-25	600 ppm*	600 ppm*
C7 + Hydrocarbons	Various	30-40	400 ppm*	400 ppm*
Benzene	71-43-2	20-60	1 ppm**	10 ppm
Cyclohexane	110-82-7	NE	300 ppm	300 ppm
Toluene	108-88-3	NE	100 ppm	100 ppm
Mixed Xylenes	1330-20-7	NE	100 ppm	100 ppm

* For n-C4 (as Butane), n-C5 (as Pentane), and n-C7 (as Heptane)

** Operations exempted by the Benzene Standard, 29CFR 1910.1028, will have a 10 ppm 8 hour TWA.

HER 03397

NA - Not Applicable NE - Not Established

C. Personal Protection Information

Ventilation: Use adequate ventilation to control exposure below recommended levels.

Respiratory Protection: For concentrations exceeding the recommended exposure level, use NIOSH/MSHA approved air purifying respirator. In case of spill or leak resulting in unknown concentration, use NIOSH/MSHA approved supplied air respirator. If conditions immediately dangerous to life or health (IDLH) exist, use NIOSH/MSHA approved self-contained breathing apparatus (SCBA) equipment.

Eye Protection: Use chemical goggles.

Skin Protection: Use full-body, long-sleeved garments. Use polyvinyl alcohol or Buna-N gloves.

NOTE: Personal protection information shown in Section C is based upon general information as to normal uses and conditions. Where special or unusual uses or conditions exist, it is suggested that the expert assistance of an industrial hygienist or other qualified professional be sought.

D. Handling and Storage Precautions

Do not get in eyes, on skin or on clothing. Do not breathe vapors. Wear protective equipment and/or garments described in Section C if exposure conditions warrant. Wash thoroughly after handling. Launder contaminated clothing before reuse.

Keep containers closed. Store in a cool, well-ventilated area away from ignition sources. Provide means of controlling leaks and spills. Bond and ground during liquid transfer.

E. Reactivity Data

Stability: Stable

Conditions to Avoid: Not Applicable

Incompatibility (Materials to Avoid): Oxygen and strong oxidizing agents. May react violently with chlorine in the presence of sunlight.

Hazardous Polymerization: Will Not Occur

Conditions to Avoid: Not Applicable

Hazardous Decomposition Products: Carbon oxides formed when burned.

F. Health Hazard Data

Recommended Exposure Limits:

See Section B.

HER 03398

Acute Effects of Overexposure:

Eye: May be slightly irritating to eyes as liquid or vapor.

Skin: May be slightly irritating.

Inhalation: May be slightly irritating to the throat and lungs. May cause headache, dizziness, sedation, incoordination and unconsciousness.

Ingestion: May cause slight irritation to intestines. May be aspirated into lungs if swallowed resulting in pulmonary edema and chemical pneumonitis.

Subchronic and Chronic Effects of Overexposure:

Benzene is designated a carcinogen by IARC, NTP and OSHA. Benzene may produce blood changes which include reduced platelets, reduced red blood cells, reduced white blood cells, aplastic anemia, leukemia or erythroleukemia. Fetal death has been produced in laboratory animals. Benzene has caused chromosome changes in humans and mutation changes in cells of other organisms.

Some components may be considered simple asphyxiants which displace oxygen in air.

Other Health Effects:

Liver and kidney changes have been noted in long term studies in animals exposed to xylenes. Fetotoxicity has been observed in animals with subchronic exposure to mixed xylenes at concentrations approximately five times the permissible exposure limit. Blood changes in animals exposed to xylene may reflect a mild toxicity to the hematopoietic system due to benzene contamination.

Exposure of pregnant rats during gestation to Toluene at levels of 250 ppm and higher produced some maternal toxicity and embryo/feto toxicity. A lifetime inhalation study in rats did not show any toxic effects even at the high dose of 300 ppm.

Behavioural signs of hearing loss were observed in rats exposed to Toluene subchronically at levels of 1000 ppm or more. Comparable effects have not been reported in humans.

Health Hazard Categories:

	Animal	Human		Animal	Human
Known Carcinogen	<u>X</u>	<u>X</u>	Toxic	<u> </u>	<u> </u>
Suspect Carcinogen	<u> </u>	<u> </u>	Corrosive	<u> </u>	<u> </u>
Mutagen	<u>X</u>	<u> </u>	Irritant	<u> </u>	<u> </u>
Teratogen	<u> </u>	<u> </u>	Target Organ Toxin	<u>X</u>	<u>X</u>
Allergic Sensitizer	<u> </u>	<u> </u>	Specify - Blood Toxin; Reproductive		
Highly Toxic	<u> </u>	<u> </u>	Toxin-Animal; Lung-Simple		
			Asphyxiant; Lung-Aspiration		
			Hazard		

HER 03399

First Aid and Emergency Procedures:

Eye: Immediately flush eyes with running water for at least fifteen minutes.

Skin: Wash with soap and water.

Inhalation: Remove from exposure. If breathing becomes shallow, give oxygen.

Ingestion: Do not induce vomiting. Seek immediate medical assistance.

Note to Physician: Gastric lavage using a cuffed endotracheal tube may be performed at your discretion.

G. Physical Data

Appearance: Clear Liquid
Odor: Pungent
Boiling Point: 90 to 650F (32 to 343C)
Vapor Pressure: 6 psig at 100F (37.8C)(Estimated)
Vapor Density (Air = 1): 3 (Estimated)
Solubility in Water: Negligible
Specific Gravity (H₂O = 1): 0.86-0.88
Percent Volatile by Volume: >50
Evaporation Rate (Ethyl Ether = 1): <1
Viscosity: Not Applicable

H. Fire and Explosion Data

Flash Point (Method Used): -50F to 50F (-45.5 to 10C)(Estimated)
Flammable Limits (% by Volume in Air): LEL - Not Established
UEL - Not Established

Fire Extinguishing Media: Dry chemical, foam or carbon dioxide (CO₂).

Special Fire Fighting Procedures: Evacuate area of all unnecessary personnel. Shut off source, if possible. Use NIOSH/MSHA approved self-contained breathing apparatus and other protective equipment and/or garments described in Section C if conditions warrant. Water fog or spray may be used to cool exposed containers and equipment. Do not spray water directly on fire - product will float and could be reignited on surface of water.

Fire and Explosion Hazards: Carbon oxides formed when burned. Highly flammable vapors which are heavier than air may accumulate in low areas and/or spread along ground away from handling site. Flashback along vapor trail may occur.

HER 03400

I. Spill, Leak and Disposal Procedures

Precautions Required if Material is Released or Spilled:

Evacuate area of all unnecessary personnel. Wear protective equipment and/or garments described in Section C if exposure conditions warrant. Shut off source, if possible and contain spill. Protect from ignition. Keep out of water sources and sewers. Absorb in dry, inert material (sand, clay, sawdust, etc.). Transfer to disposal drums using non-sparking equipment. When entry into or exit from concentrations of unknown exposure, use NIOSH/MSHA approved self-contained breathing apparatus (SCBA).

Waste Disposal (Insure Conformity with all Applicable Disposal Regulations):
Incinerate or place in RCRA permitted waste management facility.

J. DOT Transportation

Shipping Name: Petroleum Distillate
Hazard Class: Flammable Liquid
ID Number: UN 1268
Marking: Petroleum Distillate/UN 1268
Label: Flammable Liquid
Placard: Flammable/1268
Hazardous Substance/RQ: Not Applicable
Shipping Description: Petroleum Distillate/Flammable Liquid/UN 1268
Packaging References: 49 CFR 173.118 and 173.119(b)

K. RCRA Classification - Unadulterated Product as a Waste

Ignitable (D001)

L. Protection Required for Work on Contaminated Equipment

Wear protective equipment and/or garments described in Section C if exposure conditions warrant. Contact immediate supervisor for specific instructions before work is initiated.

M. Hazard Classification

☒ This product meets the following hazard definition(s) as defined by the Occupational Safety and Health Hazard Communication Standard (29 CFR Section 1910.1200):

<input type="checkbox"/> Combustible Liquid	<input type="checkbox"/> Flammable Aerosol	<input type="checkbox"/> Oxidizer
<input type="checkbox"/> Compressed Gas	<input type="checkbox"/> Explosive	<input type="checkbox"/> Pyrophoric
<input type="checkbox"/> Flammable Gas	<input checked="" type="checkbox"/> Health Hazard (Section F)	<input type="checkbox"/> Unstable
<input checked="" type="checkbox"/> Flammable Liquid	<input type="checkbox"/> Organic Peroxide	<input type="checkbox"/> Water Reactive
<input type="checkbox"/> Flammable Solid		

☐ Based on information presently available, this product does not meet any of the hazard definitions of 29 CFR Section 1910.1200.

HER 03401

Additional Comments

This product contains, or may contain, the following chemical or chemicals subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372. (See Section B).

Benzene
Cyclohexane
Toluene
Mixed Xylene

HER 03402

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PRIORITY AGENCY PHONE NUMBERS

The following Federal and State Agencies must be contacted:

<i>U.S. Coast Guard</i>	
Officer of the Day Galveston	409 - 766 - 5641
Marine Safety Office	409 - 766 - 3687
<i>Environmental Protection Agency</i>	
National Response Center	1 - 800 - 424 - 8802
24 hours	
<i>Texas Parks And Wildlife Department</i>	
Galveston Office	409 - 737 - 1222
<i>Texas Natural Resource Conservation Commission</i>	
24 hours	512 - 463 - 7727
<i>T. G. L. O. State Response Hot Line</i>	
24 hours	1 - 800 - 832 - 8224
<i>Police - Fire Department - Ambulance</i>	911
<i>Spill Response Contractors</i>	
Garner Environmental Services Inc.	1 - 800 - 424 - 1716
24 hours	
Riedel-Peterson Environmental Services	1 - 800 - 637 - 0531
24 hours.	

PERSONNEL DUTIES

The Hercules Marine facility is staffed at all times. The Manager and Superintendent are at the facility during daylight hours, 5 days per week. A foreman on duty is also at the facility. Mr. Claudio Duarte, Foreman of cleaning operations has been in charge of barge cleaning at the Hercules Marine facility for more than eleven years. Should other personnel be hired for the purpose of cleaning operations, they will receive on-the-job training needed to assure they are proficient in their efforts but with no less than a minimum of 2 weeks of on-the-job training prior to being placed on the job.

The stripping of barges is handled by a staff of a minimum of two or more workers of which one is a Foreman who operates and oversees that pumping and safety procedures are followed.

When operations have stopped, a dispatcher is always at the facility. No unauthorized visitors are allowed. Lines and lights are to be checked periodically on vessel if left unmanned.

COMMUNICATIONS

Communications during stripping operations at Hercules Marine Services are provided by telephone and VHF radio located at the dock.

Due to the short distance between barges and barge and truck, communications are normally limited to visual and direct voice communication as visual observances are possible at all times between a person on board the barge being stripped and our barge, as well as from our barge to the vacuum pump.

All hand-held radios are Coast Guard approved and Intrinsically safe.

HER 03405

EMERGENCY SHUTDOWN

The Hercules Marine facility is equipped with an inventory of oleophilic sorbent pads to absorb and contain spills of chemical on the land, the docks or the barge being cleaned. Booms, sweeps and pads for spills on the water are also stored on-shore at the facility. Both categories of this material may be obtained in less than five minutes. Each of the docks are equipped with a type ABC dry chemical fire extinguisher. Instructions for the use of these extinguisher is printed on each unit.

In the event of a chemical spill of any nature, the operator on duty should immediately take all available steps to stop the flow of chemical. This would include turning off all pumps and shutting off the necessary valves. The foreman on duty must then take steps to contain the spill if the volume so warrants it. spills on the dock would be contained by the drip pans. Spills on the water, however, may require the use of the booms or absorbent available in the warehouse.

If the volume of chemical involved requires containment it is then likely that the services of an outside service contractor may be required to pick up the bulk of the chemical. These contractors can provide vacuum trucks which are equipped to handle such situations. Vacuum trucks are efficient where there is a significant amount of chemical. A point will be reached, particularly where the spill is on the water, where the use of the available supply of oleophilic sorbents (pads, etc.) are more effective. The foreman on duty must make these decisions. In

general, a typical spill from this facility will be small and the use of sorbent materials will be all that is necessary to handle the spill. Where a chemical spill occurs on the water, the most immediate requirement is again to take all available steps to stop the flow of chemical. Should the volume of chemical spilled be large, efforts should immediately begin to provide containment. Some 200 feet of boom are available at the facility for such purposes. The use of a boom is particularly advisable if the flow of chemical cannot be stopped. Booms can act as a catchment basin for such chemical flows for an interim period of time if the booms are situated properly relative to the prevailing wind and currents.

As quickly as possible after a spill on the water has been detected and no later than 24 hours after such detection, the spectrum of required phone calls should be made. The two calls which are of the utmost importance are the calls to the Galveston Captain of the Port and the Texas Department of Water Resources. The person making the calls should include the following information as part of the telephone report;

1. Name and telephone number of reporter
2. Where known, the name, address, and telephone number of the party in charge of, or responsible for, the activity or facility and of the party at the site of the spill or accidental discharge who is in charge of operations at the site;
3. The exact location of the spill or discharge, including the name of the waters involved;

4. Time and type of incident (e.g., fire, explosion, etc.);
5. The type of material spilled or discharged;
6. An estimate of the quantity of material spilled or discharged;
7. The extent of actual or potential water pollution;
8. The extent of injuries, if any;
9. The stage being taken or proposed to contain and clean up the spilled or discharges material; and
10. The possible hazards to human health or the environment.

The Hercules Marine facility has certain features which are important relevant to the potential for spills on water, the magnitude of these spills and the potential environmental damage.

These features are as follows:

1. The average quantity of product transferred in any single cleaning operations is some 50 to 400 gallons.
2. The maximum rate of chemical transfer in a 1 1/2 inch hose is some 25gpm and 50gpm respectively.
3. The facility is not close to an area which would be significantly impacted by the small quantity of oil that would be anticipated from a facility spill. The maximum anticipated spill would be estimated at no more than 1 barrel which would be classified as a minor spill (less than 240 barrels).

BARGE CLEANING PROCEDURE

1. Secure the barge to be cleaned at the gas free dock and set gangway.
2. Obtain work order and the name of the last product the barge contained.
3. Hold safety meeting and go over the chemical data sheet and cleaning procedure.
4. Inspect the barge for the location of cargo piping, deepwell, pump, check valve, stripping poles, etc. and determine if ballasting is required. Tilt cargo tanks for cleaning.
5. Open cargo tanks and check for product using approved respirators.
6. Using the approved respirator, set up venture air mover downwind over the butterworth hatch opening to pull the product fumes back into the cargo tank and away from the hatch opening to be used to strip product through. Set up stripping pump and/or vacuum and remove all free product from the cargo tanks and transfer it to yard storage tanks for disposal.
7. The product is removed from the cargo piping and associated equipment by draining it into the cargo tanks and using the stripping pipes built into the barge piping system to pump it or vacuum it out. Additional product is removed by using air pressure to blow down and into the cargo tanks.

HER 03409

8. Using the barge header, a high pressure water hose is attached to the manifold and the piping system is washed down and into the barge tanks. After washing is complete, air pressure is used to blow all the free water from the system down and into the cargo tanks.
9. A marine chemist is called to certify the barges safe for hot work and entry of mechanical workers after cleaning and gas freeing is complete. All testing is done using the MSA EXPLOSIMETER-OXYGEN METER, DRAGER TUBES AND GAS TECK DETECTOR SYSTEMS.
10. Using approved respirators, add additional air movers and ventilate until test show the tanks are gas free for entry with respirators to hand hose (hand held fire nozzle) wash the interior of the cargo tanks, The wash water is pumped to shore storage tanks for disposal using portable air pump and/or vacuum.
11. If the job dictates, the cargo tanks are dried using the venture air movers.

BARGE STRIPPING PROCEDURES ONLY

The Foreman is responsible for directing the product of whatever barge has docked for the purpose of stripping products. When stripping operations begin the Foreman conducts operations as described in the following narrative.

When transfer operations are to occur, the Foreman initially assured that the barge to be stripped is secure to our dock. Next a D.O.I. sheet is filled out. Ground cables are connected, hoses are hooked into barges stripping system usually by Kamlock connectors. All stripping procedures are done by suction with vacuum pumps. Hoses are connected to our vacuum pump with kamlock connectors. All stripping is done in a safe and responsible manner. If weather conditions worsen, all stripping is stopped and will not proceed until conditions improve. After stripping is completed all hoses are capped off and cleaned and stored on dock.

Once at our dock, transfers are done in this procedure. Barge is secured to our dock with a minimum of four - three inch lines.

MONITORING DEVICES

No monitoring devices are required by the Captain of the Port at this facility.

HER 03412

CONTAINMENT

Two Hundred feet of floating boom is located on the south side of barge cleaning area at all times to contain any accidental discharge of product. Oil absorbent pads and floating absorbent booms are located at our barge cleaning area.

All are available on a 24 hour per day basis and can be deployed immediately.

Containment boom is stored on south side of cleaning dock. To deploy the boom, take out one section at a time; each section is 100 feet. Launch small skiff, which is on north side of cleaning area. Tie one end off to a stationary object and deploy the boom around the spill. Attach each section of the boom as needed until the entire spill is contained. Once contained begin clean-up procedures.



GARNER

**ENVIRONMENTAL
SERVICES, INC.**

LAMARQUE
3197 MAIN STREET
LAMARQUE, TEXAS 77591
PHONE: 409/933-0308
FAX: 409/933-0678

HOUSTON
314 ALLEN GENOA RD.
HOUSTON, TEXAS 77017
PHONE: 713/920-1300
FAX: 713/920-1359

PORT ARTHUR
2706 S. GULFWAY DR. / P.O. BOX 1431
PORT ARTHUR, TEXAS 77640
PHONE: 409/983-3646
FAX: 409/983-3851

LAMARQUE EMERGENCY SPILL RESPONSE EQUIPMENT

1	28'	Emergency Response Trailer
1	32'	Gooseneck Spill Trailer
3	16'	Low Boy Spill Trailer
8000 Feet	18"	Oil Spill Boom
3000 Feet	36"	Oil Spill Boom
5	16'	Oil Spill Boats with 20-30 HP Boat Motors
1	12'	Spill Boat without Motor
2	21'	Spill boats
1	24'	Self Propelled Skimmer
6	39-T	Vacuum Skimmer
1	24'	Work Boat - 300 HP
2	2"	Wash Pumps
4	3"	Wash Pumps
6	3"	Weldon Pumps
1		Generator / Light Plant
1		Chain Saw
As Needed Pollution Cans		
As Needed Shovels, Rakes, Dip Nets, Pitch Forks		
1		Superintendents Car with Car Phone
5		Pick-Up Trucks, Four with Car Phone
5		Supervisors
5		Operators
15		Laborers
8	80 bbl	Vacuum Trucks
3	80 bbls	Super Suckers
7		Roll Off Trucks
Available 2 Hrs. Coming From Houston		
8	40 Yard	Roll Off Boxes
8	30 Yard	Roll Off Boxes
140	20 Yard	Roll Off Boxes
15		Vacuum Boxes

RIEDEL ENVIRONMENTAL SERVICES, INC.

DEER PARK, TEXAS

ALL PERSONNEL

OSHA 29 CFR 1910.120 40 hazardous materials training for hazardous waste site activities.
Medic first aid basic CPR first aid Doctors Certificate 49 CFR 391.41-391.49

PERSONNEL:

5 Supervisor/Consultant
4 Foreman
15 Pollution Personnel

EQUIPMENT:

2 18" Stake Truck
10 1/2 & 3/4 Ton Pick up Trucks
1 "Clif" Response Trailer
1 24' Boom & Work Boat w/150hp Motor
2 16' Aluminum Work Boats w/40hp Motors
6 16' Aluminum Work Boats w/25hp Motors
2 10' Aluminum Work Boats w/outboard Motors
5 16' Boat Trailers
1 30' Goos neck with 2000' 18" Containment Boom
8 2" Wash Pumps with 20' Suction & Discharge Hose
5 2" Trash Pumps with 20' Suction & Discharge Hose
1 2" Wilden Diaphragm
2 2" Diaphragm
1 ARO Chemical Spray Pump
2 1 1/2" 25' Length Hoses
2 2" 25' Length Hoses
1 50' Length Air Hose
300' Discharge Hose 20' Length
300' Suction Hose 20' Length
4 1 1/2" Compressor 50' Length
4 2.3KW Generators
1 3.6KW 120V 16HP Generator
2 Weed Eaters
1 Organic Vapor Monitor
2 Gastech LEL/O₂ Meter
6 First Aid Trauma Kit & Respirator Repair Kit
10 SCBA Survivor Kits & Masks
20 Splash Suits
4 Level A Suits (Butyl, Chlorinate Polyethylene, Polyvinyl Chloride)
10 Air Cylinders
1 Ansul 15lb CO₂
6 20lb Large Fire Ext.
1 Skim Pak Skimmer 4000 GPH
4 Swiss Oela Skimmer

HER 03415

DEER PARK, TEXAS

EQUIPMENT Continued:

1	Chain Saw
1	24' Aluminum Ladder
1	580A OVM
2	High Intensity Vapor Lights
2	Field Office
9000'	18" Oil Containment Boom
500'	4 X 6' Oil Boom
2	Compaq Portable II Computer
1	Compaq Deskpro 286 Computer
15	Cases Disposable Saranex Chemical Suits
5	Cases Disposable Barricade Chemical Suits
5	Cases Chlorinated Polyethylene Chemical Suits
5	Cases Polyvinyl Chloride Chemical Suits
Cs	Variety of Chemical Gloves
Cs	Variety of Chemical Sampling Equipment
2	Field Hazard Identification Test Kit

MATERIALS:

2000	18 X 18" Sorbent Pads
100	Sorbent Rolls
400	Bales 8" Sorbent Boom
40	Bales Sorbent Sweeps
480	Bales Fiberperl (Bags)
150	20 Gallon Pollution Cans
35	Hand Pollution Nets
10	Pitch Forks
20	Rakes
20	Shovels
70	55 Gallon Drums
6000'	1/2" Polypropylene Rope
6000'	1/4" Polypropylene Rope
25	Wipes (Boxes)
200	Heavy Duty Industrial Plastic Bags
10	Polyethylene (Rolls)

FIGURES WILL FLUCTUATE DUE TO JOBS IN PROGRESS AND BRANCH SALES.
PERSONNEL AND EQUIPMENT LOCATED IN DEER PARK, TEXAS

EMERGENCIES

Contracts are held with several approved Environmental Spill Response companies. List of telephone numbers are listed on Priority Agency List.

Each of the docks are equipped with fire extinguisher (type A,B,C).

To operate portable fire extinguisher, pull the pin out, turn upright and squeeze the lever while directing the extinguisher nozzle at the base of the flame. Use a slow sweeping motion.

COUNTER MEASURES

In the event of a spill from a barge, Hercules follows these procedures:

OVER WATER:

1. The cleaning crew will install containment boom across slip.
2. Locate cause of spill and stop spill from increasing.
3. Notify appropriate authority. Over water, we would notify the United States Coast Guard.

A. Telephone report should contain:

1. Complete address of this facility with phone number.
2. The exact location of the spill (mile marker on Intracoastal Waterway).

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3. Type of material spilled.
 4. Estimated quantity of material spilled.
 5. Extent of actual and potential water pollution.
 6. Procedure being taken to contain an clean up spill.
4. Using oil absorbing pads and our safety boat going into spill, absorb all noticeable spilled material.
 5. Oil pads will be put into plastic drums and shipped to designated disposal site (Empak) for proper disposal.

ON LAND:

1. Use oil absorbing material to contain spill to smallest area.
2. Locate cause of spill and stop spill from increasing.
3. Notify appropriate authority (Texas Water Commission).
 1. Conduct telephone report. See Appendix for telephone numbers.
4. Oil pads are then used to soak up as much liquid as possible. Oil absorbing material is then spread into dirt. Dirt and pads are then placed in plastic drums and shipped to disposal site (Empak) for proper disposal.

All docks are equipped with ropes for barge mooring. For fire-fighting purposes, the yard is equipped with Type ABC dry chemical fire extinguisher. Each dock is well-lighted. These lights have

HER 03418

been designed to provide sufficient illumination to assure that cleaning and repair operations can be conducted at any time of the day.

SECURITY

Hercules Marine Facility yard has fence on the northern boundary by Marlin Lane. The facility has twenty-four hour security/dispatch services.

LAWS

The Federal and State Laws absolutely forbid the slightest discharge of any oil substance on the waters and adjoining shorelines of the United States. Any accidental discharge is to be acted upon immediately and the United States Coast Guard and other primary agencies, as indicated on the attached list, must be notified as soon as possible. A copy of applicable State and Federal Laws are provided in Attachment 5.

HERCULES MARINE SERVICE PERSONNEL

Larry Ballinger	409/925-7172
Jimmy Jackson	409/849-7298
Claudio Duarte	409/265-2134
Beeper	713/612-3471

FIRE DEPARTMENT	FREEPORT	409-239-1211
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POLICE	FREEPORT	409-239-1211
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*AMBULANCE	FREEPORT	409-239-1211
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CLUTE/ LAKE JACKSON	409-297-1101
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HOSPITAL	LAKE JACKSON	409-237-4411
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BRAZOSPORT MEMORIAL
100 MEDICAL DRIVE
LAKE JACKSON, TEXAS

***24 HOUR SERVICE**

DIRECTIONS;

Take Hwy. 332 west towards Lake Jackson. Proceed approximately 15 miles. At the corner of Oak Street and Hwy. 332, turn left. Proceed approximately six blocks on Oak Street. The hospital is on the left.

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PRIORITY AGENCY PHONE NUMBERS

The following Federal and State Agencies must be contacted:

<i>U.S. Coast Guard</i>	
Officer of the Day Galveston	409 - 766 - 5641
Marine Safety Office	409 - 766 - 3687
<i>Environmental Protection Agency</i>	
National Response Center	1 - 800 - 424 - 8802
24 hours	
<i>Texas Parks And Wildlife Department</i>	
Galveston Office	409 - 737 - 1222
<i>Texas Natural Resource Conservation Commission</i>	
24 hours	512 - 463 - 7727
<i>T. G. L. O. State Response Hot Line</i>	
24 hours	1 - 800 - 832 - 8224
<i>Police - Fire Department - Ambulance</i>	911
<i>Spill Response Contractors</i>	
Garner Environmental Services Inc.	1 - 800 - 424 - 1716
24 hours	
Riedel-Peterson Environmental Services	1 - 800 - 637 - 0531
24 hours.	

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APPLICABLE LAWS

HER 03423

(d) An exemption is granted or denied in writing. The decision of the Chief, Office of Marine Environment and Systems is a final agency action.

§ 154.110 Letter of intent.

(a) The facility operator of any facility to which this part applies must submit a letter of intent to operate a facility or to conduct mobile facility operations to the COTP not less than 60 days before the intended operations unless a shorter period is allowed by the COTP. Previously submitted letters of intent need not be resubmitted.

(b) The letter of intent required by paragraph (a) of this section may be in any form but must contain—

(1) the name, address, and telephone number of the facility operator;

(2) the name, address, and telephone number of the facility or, in the case of a mobile facility, the dispatching office; and

(3) except for a mobile facility, the geographical location of the facility in relation to the associated body of navigable waters.

(c) The facility operator of any facility for which a letter of intent has been submitted, shall within five (5) days advise the COTP in writing of any changes of information and shall cancel, in writing, the letter for any facility at which oil transfer operations are no longer conducted.

§ 154.120 Facility examinations.

(a) The facility operator shall allow the Coast Guard, at any time, to make any examination and shall perform, upon request, any test to determine compliance with this part and part 156, as applicable. The facility operator shall conduct all required testing of facility equipment in a manner acceptable to the Coast Guard.

(b) The COTP shall provide the facility operator with a written report of the results of the examination for the record required by § 154.740(e) and shall list the deficiencies in the report when the facility is not in compliance with the requirements in this part and Part 156 of this chapter.

Subpart B—Operations Manual

§ 154.300 Operations manual general.

(a) The facility operator of each facility to which this part applies shall submit, with the letter of intent, an operations manual that—

(1) describes how the applicant meets the operating rules and equipment requirements prescribed by this part and Part 156 of this chapter;

(2) describes the responsibilities of personnel under this part and Part 156 of this chapter in conducting oil transfer operations; and

(3) includes translations into a language or languages understood by all designated persons in charge of transfer operations employed by the facility.

(b) The facility operator shall maintain the operations manual so that it is—

(1) current; and
(2) readily available for examination by the COTP.

(c) The COTP shall review the operations manual when submitted, after any substantial amendment, and as otherwise required by the COTP.

(d) In determining whether the manual meets the requirements of this part and Part 156 of this chapter the COTP shall consider the size, complexity, and capability of the facility.

(e) If the manual meets the requirements of this part and Part 156 of this chapter, the COTP shall issue a "letter of adequacy" as described in § 154.325.

(f) The facility operator shall ensure that a sufficient number of copies of the operations manual, including a sufficient number of the translations required by paragraph (a)(3) of this section, are readily available for each facility person in charge while conducting an oil transfer operation.

Note.—The facility operator may request that the contents of the operations manual or portions thereof be considered commercial or financial information that is privileged or confidential. Under the Freedom of Information Act, the Coast Guard would withhold any part of the contents of the operations manual from public disclosure upon determining that it is commercial or financial information that is privileged or confidential.

§ 154.310 Operations manual contents.

(a) Each operations manual required by § 154.300 must contain—

(1) The geographic location of the facility;

(2) A physical description of the facility including a plan of the facility showing mooring areas, transfer locations, control stations, and locations of safety equipment;

(3) The hours of operation of the facility;

(4) The sizes, types, and number of vessels that the facility can transfer oil to or from simultaneously;

(5) For each product transferred at the facility—

(i) Generic or chemical name; and
(ii) The following cargo information:
(A) The name of the cargo, as listed in Table 30.25-1 of 48 CFR;

(B) A description of the appearance of the cargo;

(C) A description of the odor of the cargo;

(D) The hazards involved in handling the cargo;

(E) Instructions for safe handling of the cargo;

(F) The procedures to be followed if the cargo spills or leaks, or if a person is exposed to the cargo; and

(G) A list of fire fighting procedures and extinguishing agents effective with fires involving the cargo.

(6) The minimum number of persons on duty during transfer operations and their duties;

(7) The names and telephone numbers of facility, Coast Guard, and other personnel who may be called by the employees of the facility in an emergency;

(8) The duties of watchmen, required by § 155.810 of this chapter and 48 CFR 35.05-15, for unmanned vessels moored at the facility;

(9) A description of each communication system required by this part;

(10) The location and facilities of each personnel shelter, if any;

(11) A description and instructions for the use of drip and discharge collection and vessel slop reception facilities, if any;

(12) A description and the location of each emergency shutdown system;

(13) Quantity, types, locations, and instructions for use of monitoring devices if required by § 154.325;

(14) Quantity, type, location, instructions for use, and time limits for gaining access to the containment equipment required by § 154.545;

(15) Quantity, type, location, and instructions for use of fire extinguishing equipment required by § 128.15(j) of this chapter;

(16) The maximum relief valve setting (or maximum system pressure when relief valves are not provided) for each oil transfer system;

(17) Procedures for—

(i) Operating each loading arm including the limitations of each loading arm;

(ii) Transferring oil;

(iii) Completion of pumping; and

(iv) Emergencies;

(18) Procedures for reporting and initial containment of oil discharges;

(19) A brief summary of applicable federal, state, and local oil pollution laws and regulations;

(20) Procedures for shielding portable lighting authorized by the COTP under § 154.570(c); and

(21) A description of the training and qualification program for persons in charge.

(b) The facility operator shall incorporate a copy of each amendment to the operations manual under § 154.320 in each copy of the manual with the related existing requirement, or add the amendment at the end of each

COAST GUARD OIL REGULATIONS

manual if not related to an existing requirement.

(c) The operations manual must be written in the order specified in paragraph (a) of this section, or contain a cross-referenced index page in that order.

§ 154.320 Operations manual amendment.

(a) Using the following procedures, the COTP may require the facility operator to amend the operations manual if the COTP finds that the operations manual does not meet the requirements in this part:

(1) The COTP shall notify the facility operator in writing of any inadequacies in the operations manual. The facility operator may submit written information, views, and arguments on and proposals for amending the manual within 14 days from the date of the COTP notice. After considering all relevant material presented, the COTP shall notify the facility operator of any amendment required or adopted, or the COTP shall rescind the notice. The amendment becomes effective 30 days after the facility operator receives the notice, unless the facility operator petitions the Commandant to review the COTP's notice, in which case its effective date is delayed pending a decision by the Commandant. Petitions to the Commandant must be submitted in writing via the COTP who issued the requirement to amend.

(2) If the COTP finds that there is a condition requiring immediate action to prevent the discharge or risk of discharge of oil that makes the procedure in paragraph (a)(1) of this section impractical or contrary to the public interest, the COTP may issue an amendment effective on the date the facility operator receives notice of it. In such a case, the COTP shall include a brief statement of the reasons for the findings in the notice. The owner or operator may petition the Commandant to review the amendment, but the petition does not delay the amendment.

(b) The facility operator may propose amendments to the operations manual by—

(1) Submitting any proposed amendment and reasons for the amendment to the COTP not less than 30 days before the requested effective date of the proposed amendment; or

(2) If an immediate amendment is needed, requesting the COTP to approve the amendment immediately.

(c) The COTP shall respond to proposed amendments submitted under paragraph (b) of this section by—

(1) Approving or disapproving the proposed amendments;

(2) Advising the facility operator whether the request is approved, in

writing, before the requested date of the amendments;

(3) Including any reasons in the written response if the request is disapproved; and

(4) If the request is made under paragraph (b)(2) of this section immediately approving or rejecting the request.

(d) Amendments to personnel and telephone number lists required by § 154.310(a)(8) do not require prior COTP approval, but the COTP must be advised of such amendments as they occur.

§ 154.325 Operations manual letter of adequacy.

(a) The letter of adequacy is a letter, from the COTP to the facility operator, certifying that the operations manual meets the requirements of this part.

(b) No person may use an operations manual for oil transfer operations, as required by § 154.120 (1)(2), (1)(3), and (u)(2) of this chapter, unless the facility operator has a valid letter of adequacy for the operations manual.

(c) The requirement in paragraph (b) of this section for a valid letter of adequacy is effective either on (date three years after effective date of the final rule); upon issuance to a facility operator of the first letter of adequacy; or upon any substantial amendment to the operations manual, whichever is earliest.

(d) The letter of adequacy is voided if the facility operator—

(1) amends the operations manual without following the procedures in § 154.320; or

(2) fails to amend the operations manual when required by the COTP.

Subpart C—Equipment Requirements

§ 154.500 Hose assemblies.

Each hose assembly used for transferring oil must meet the following requirements:

(a) The minimum design burst pressure for each hose assembly must be—

(1) At least 600 pounds per square inch; and

(2) At least four times the sum of the pressure of the relief valve setting (or four times the maximum pump pressure when no relief valve is installed) plus the static head pressure of the oil transfer system at the point where the hose is installed.

(b) The maximum allowable working pressure (MAWP) for each hose assembly must be—

(1) At least 150 pounds per square inch; and

(2) More than the sum of the pressure of the relief valve setting (or the maximum pump pressure when no valve

is installed) plus the static head pressure of the oil transfer system at the point where the hose is installed.

(c) Each nonmetallic hose must be usable for oil service.

(d) Each hose assembly must either have—

(1) Full threaded connections;

(2) Flanges that meet standard B16.5—1977, *Steel Pipe Flanges and Flange Fittings*, or standard B.16.24—1971, *Brass or Bronze Pipe Flanges*, of the American National Standards Institute (ANSI); or

(3) Quick-connect couplings that are acceptable to the Commandant.

(e) Except as provided in paragraph (f) of this section, each hose must be marked with—

(1) The products for which the hose may be used or the words "oil service";

(2) Maximum allowable working pressure;

(3) Date of manufacture; and

(4) Date of the latest test required by § 156.170 of this chapter.

(f) The information required by paragraph (e)(3)–(4) of this section need not be marked on the hose if it is recorded elsewhere at the facility and the hose is marked to identify it with that information.

(g) The hose burst pressure and the pressure used for the test required by § 156.170 of this chapter must not be marked on the hose and must be recorded elsewhere at the facility as described in paragraph (f) of this section.

(h) Each hose used to transfer oil for fuel to a vessel that has a fill pipe for which containment can not practically be provided must be equipped with an automatic back pressure shutoff nozzle.

§ 154.510 Loading arms.

(a) Each mechanical loading arm used for transferring oil and placed into service after June 30, 1973, must meet the design, fabrication, material, inspection, and testing requirements in ANSI Standard B31.3—1976 with Addenda B31.3a—1978, *Petroleum Refinery Piping*.

(b) The manufacturer's certification that the standard in paragraph (a) of this section has been met must be permanently marked on the loading arm or recorded elsewhere at the facility with the loading arm marked to identify it with that information.

(c) Each mechanical loading arm used for transferring oil must have a means of being drained or closed before being disconnected after transfer of oil.

§ 154.520 Closure devices.

The facility must have enough butterfly valves, wafer-type resilient seated valves, blank flanges, or other [Sec. 154.520]

STATE OF TEXAS
OIL AND HAZARDOUS SUBSTANCES POLLUTION
CONTINGENCY PLAN

.001 Purpose

The purpose of this plan is to provide procedures for a coordinated response to spills or accidental discharges of oil or other hazardous materials into the waters or adjacent to the waters of the State of Texas by State agencies concerned with protection of the environment and the public health and welfare. It is also the purpose of this plan to outline methods by which such spills and accidental discharges will be reported to State agencies having regulatory responsibility over the activities and/or facilities involved in spills or accidental discharges.

.002 Authority

Section 26.039 of the Texas Water Code requires that when an accidental discharge or spill occurs at, or from, any activity or facility which causes or may cause pollution, the individual operating, in charge of, or responsible for the activity or facility shall notify the office of the Texas Department of Water Resources as soon as possible and not later than 24 hours after the occurrence. In addition, Sections 26.261-26.268 of the Texas Water Code established the Texas Coastal Protection Fund and provides that the department will arrange for any necessary cleanup activities, without undue delay, for spills and discharges of oil or hazardous substances in harmful quantities into the coastal water of the State. If a discharge or spill presents or threatens to present an occurrence of disaster proportions, the Governor shall utilize the authority granted him under the Texas Disaster Act of 1975 (Article 6889-7, Vernon's Texas Civil Statutes) to make available and bring to bear all resources of the State to prevent or lessen the impact of such a disaster. It should be noted that this plan has been incorporated into the overall State of Texas disaster plan.

The department is empowered and directed to seek reimbursement of monies spent from the fund from the federal government and/or from the party(s) (where known or determined) responsible for the spill or discharge.

The department has been designated by the Governor of Texas, in accordance with the Clean Water Act and the National Oil and Hazardous Substances Pollution Contingency Plan, as the State's principal representative to the Regional Oil and Hazardous Material Pollution Response Team. Disaster Emergency Services of the Texas Department of Public Safety is the alternate representative.

The Railroad Commission of Texas, as provided in Section 26.131 of the Texas Water Code is solely responsible for the control and disposition of waste and the abatement and prevention of pollution of surface and subsurface water resulting

from activities associated with the exploration, development, and production of oil or gas.

Implementation of the emergency response provisions of the Department's Rules 156.22.~~06.001~~⁰¹⁶ regarding industrial solid waste management may bring about the need for additional changes in the State's pollution contingency plan. The reader's attention is directed to Appendix G. In addition, attention is invited to the rule's specific provisions as follows:

- (a) 156.22.06.001-~~005~~⁰¹⁶ pages ~~88-93~~⁷⁸⁻⁹⁴ concerning standards applicable to generators of hazardous industrial solid waste;
- (b) 156.22.07.003 page ~~88~~⁹⁶ concerning standards applicable to carriers of hazardous industrial solid waste and hazardous waste discharges;
- (c) 156.22.09.001-.007 pages ~~94-100~~¹¹⁵⁻¹¹⁷ concerning preparedness and prevention; and
- (d) 156.22.10.001-.007 pages ~~105-110~~¹¹⁹⁻¹²⁵ concerning contingency plan and emergency procedures.

.003 Scope

This plan will be effective for all waters within the territorial limits of the State of Texas. The party responsible for any spill or discharge is not absolved or excused from complying with applicable federal regulations concerning spills of oil, hazardous substances, or hazardous wastes, or from the responsibility of reporting directly to the EPA or U.S. Coast Guard concerning such spills.

.004 Definitions

- (a) Department—Department of Water Resources.
- (b) Board—Texas Water Development Board.
- (c) Accidental Discharge—an act or omission through which waste or other substances are inadvertently discharged into water in the State.
- (d) Spill—an act or omission through which waste or other substances are deposited where, unless controlled or removed, they will drain, seep, run, or otherwise enter water in the State.
- (e) Other Substances or Pollutants—substances which may be useful or valuable and therefore are not ordinarily considered to be waste, but which will cause pollution if discharged into water in the State.
- (f) Oil—oil of any kind or in any form, including but not limited to petroleum, fuel oil, liquid hydrocarbons, sludge oil refuse, carbon compound solvents, and oil mixed with wastes other than dredging spoil.

- (g) **Hazardous Substance**—any substance designated as such by the administrator of the Environmental Protection Agency pursuant to the Federal Water Pollution Control Act and by the board.
- (h) **Hazardous Waste**—any waste or combination of wastes identified or listed as a hazardous waste by the administrator of the United States Environmental Protection Agency pursuant to Section 3001 of the Resource Conservation and Recovery Act of 1976. The Administrator has identified the characteristics of hazardous wastes and listed certain wastes as hazardous in Title 40 of the Code of Federal Regulations, Part 261, Subparts C and D, respectively.
- (i) **Pollution**—the alteration of the physical, thermal, chemical, or biological quality of, or the contamination of, any water in the State that renders the water harmful, detrimental, or injurious to humans, animal life, vegetation, or property or to public health, safety, or welfare, or impairs the usefulness or the public enjoyment of the water for any lawful or reasonable purpose.
- (j) **Harmful Quantity**—that quantity of oil or hazardous substance the discharge or spill of which is determined to be harmful to the public health or welfare by the administrator of the Environmental Protection Agency pursuant to the Federal Water Pollution Control Act and by the board.
- (k) **Water or Water in the State**—ground water, percolating or otherwise, lakes, bays, ponds, impounding reservoirs, springs, rivers, streams, creeks, estuaries, marshes, inlets, canals, the Gulf of Mexico within the territorial limits of the State, and all other bodies of surface water, natural or artificial, inland or coastal, fresh or salt, navigable or nonnavigable, and including the beds and banks of all watercourses and bodies of surface water, that are wholly or partially inside or bordering the State or inside the jurisdiction of the State.
- (l) **Inland Waters**—generally those waters, including tidal inlets, upstream from coastal waters.
- (m) **Coastal Waters**—generally coastal bays and those marine waters navigable by deep draft vessels.
- (n) **Minor Oil Spills**—less than 24 barrels (1,000 gallons) in inland waters or less than 240 barrels (10,000 gallons) in coastal waters.
- (o) **Medium Oil Spills**—from 24 barrels (1,000 gallons) to 240 barrels (10,000 gallons) in inland waters or from 240 barrels (10,000 gallons) to 2,400 barrels (100,000 gallons) in coastal waters.
- (p) **Major Oil Spills**—more than 240 barrels (10,000 gallons) in inland waters or more than 2,400 barrels (100,000 gallons) in coastal waters.
- (q) **Activity or Facility**—includes any and all means of transport whether by pipeline, barge, ship or vessel, or other vehicle, as well as any stationary facility including, but not limited to, waste treatment facilities, tank farms, storage areas, sludge pits, and/or industrial solid waste sites.

.005 Spill Discovery

Upon discovery of medium and major oil spills or hazardous substances/wastes spills, immediate telephone reports are required (see .006 page 4). All other spills or accidental discharges of oil or other substance or pollutant into or adjacent to the waters of the State of Texas, shall be reported by telephone as soon as possible and not later than 24 hours after the occurrence to the appropriate State of Texas agency listed below:

- (a) For spills or accidental discharges of hazardous substances/wastes and oil *other than* crude oil, drilling mud, distillate, condensate and natural gas products closely associated with the exploration, development and production of oil and gas, *the Texas Department of Water Resources should be notified immediately.*
- (b) For spills or accidental discharges associated with the exploration, development and production of oil and gas such as crude oil, drilling mud, distillate, condensate and natural gas products, *the Texas Railroad Commission should be notified immediately.*

Upon receipt of telephone reports, the agency notified shall, as soon as possible, but not later than 24 hours, relay the information received to other concerned State agencies as appropriate (see .005 and .006 page 4 and 5). Reports of spills or accidental discharges shall be made to the Texas Department of Water Resources either directly or through the Texas Railroad Commission in every case where there is an actual or potential threat of pollution to water in the State.

The Office of the Governor shall also be alerted by the Department of a significant spill or discharge of oil or hazardous substances/wastes.

.006 Telephone Reports

Contents of telephone reports shall be as follows:

- (a) Name and telephone number of reporter;
- (b) where known, the name, address, and telephone number of the party in charge of, or responsible for, the activity or facility and of the party at the site of the spill or accidental discharge who is in charge of operations at the site;
- (c) the exact location of the spill or discharge, including the name of the waters involved;
- (d) Time and type of incident (e.g., fire, explosion, etc.);
- (e) the type of material spilled or discharged;
- (f) an estimate of the quantity of material spilled or discharged;
- (g) the extent of actual and potential water pollution;

- (h) the extent of injuries if any;
- (i) the steps being taken or proposed to contain and clean up the spilled or discharged material; and
- (j) the possible hazards to human health or the environment.

To show interest and/or involvement of other state agencies for notification or other purposes, the following tabulation is provided as a brief guide.

Texas Department of Water Resources	S	S	S	S	S	S	S	P	S	S	P	S
Railroad Commission of Texas	S	S		S	S	S	S		P	S		
Texas Parks and Wildlife Department		P								S		
Texas Department of Public Safety— Division of Disaster Management Emergency Services			S	S						P		
Texas Department of Health	P									S		S
Texas Department of Highways and Public Transportation				P				S		S		
Texas Air Control Board					P					S		
General Land Office							P			S		
Office of the Governor of Texas			P			P				S	S	
	Apparent threat to public or environmental health	Apparent threat to fish and wildlife	Spills of disaster proportions	Highway Transportation related spills	Apparent threat to air pollution	Medium and Major oil spills	Apparent threat to state-owned land	Coastal Protection Fund Spill cleanup	Rail Transportation related spills	Communications	Hazardous Substances	Hazardous Waste

P — Primary
S — Shared

Persons within the concerned agencies to be notified are as follows:

	Office	Home
Texas Department of Water Resources		
David Barker	512/475-5695	or 863-2105
Answering Service (nights, weekends and holidays)	512/475-2651	
Railroad Commission of Texas		
Willis Streed	512/445-1301	or 459-7143
Bill R. Hall	512/445-1302	
Emergency Numbers (days, nights, weekends and holidays)	512/445-1365	
	512/475-6143	
Texas Parks and Wildlife		
Dennis Palafox	512/479-4864	or 472-3905
Leland Roberts	512/479-4864	
Robert Kemp	512/479-4857	
Communications Center (all hours--Law Enforcement)	512/479-4848	
Texas Department of Public Safety		
Bill Seals	512/465-2138	
Norm Walker or Steve Gasper	512/465-2138	
Robert Lansford	512/465-2138	
Non-Duty Hours (Ask for duty officer in Emergency Emergency Management)	512/465-2000	
Texas Department of Health		
Dave Cochran	512/458-7541	or 453-6723
Water Hygiene Division C. K. Foster	512/458-7533	or 453-2486
Shellfish Sanitation Control Division (Coastal Spills) Neil B. Travis	512/458-7510	or 452-9693
Bureau of Radiation Control Division		
David K. Lacker	835-7000 512/458-7044	or 295-3026
Radiation Emergency Reporting (24 Hours)	512/458-7460	
Bureau of Solid Waste Division MANAGEMENT		
Jack Carmichael	512/458-7271	or 345-2006

Texas Air Control Board

Emergency Action (During Working Hours) 512/451-5711, Ext. 210, 306
Jan H. Moneysmith 863-4394

General Land Office

Mike Hightower 512/475-1166 or 288-1871

Texas Department of Highways and Public Transportation

Gene Sparks 512/475-3588 or 444-2834

Office of the Governor of Texas

Ward Goessling 512/475-6021 or 345-2764

Environmental Protection Agency, Region VI (Dallas Office)

Wallace Cooper and Richard C. Peckham 214/767-2720
Robert G. Forest and David Lopez 214/767-2720
Emergency Response Number (24 Hours) 214/767-2666

United States Coast Guard Personnel

Sabine River Area COTP
Captain J. J. Wicks 713/983-8230 or
1621

Galveston Harbor Area Marine Safety Officer
Captain Robert F. Ingraham 713/763-8831
Executive Officer: Commander
M. H. Dennis 713/763-8831

Houston Area COTP
Commander Ralph W. H. Bartells 713/672-6639

Corpus Christi Area Marine Safety Officer
Captain G. C. Hinson 512/888-3162 or
3378

Port Isabel Area Station
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.007 Oil Spills

(a) Reporting

As indicated (see .004 Definitions) oil spills are classified minor, medium or major spills, depending upon the volume of oil spilled and the waters which might be affected, i.e., inland or coastal waters. Procedures concerning reporting of oil spills are as follows:

(1) Minor Oil Spills (see .004 Definitions)

- a. Spills of crude oil, distillate, condensate and gas plant products closely associated with oil and gas production shall be reported to the nearest Texas Railroad Commission District Office (see Appendix A,4). The Railroad Commission District Office, in turn, will report all such spills that reach surface waters of the State of Texas to the Railroad Commission Central Office in Austin. Spills in excess of 5 barrels, in sensitive areas involving surface waters will be reported as soon as possible by the Railroad Commission Central Office to the Texas Department of Water Resources Central Office in Austin, Texas. The Railroad Commission will inform the department of minor oil spills in excess of 5 barrels not in sensitive areas by means of a copy of the Railroad Commission's monthly oil spill report. The department will inform its district offices as appropriate.
- b. Spills of all other types of oil, i.e., oil or gas not closely associated with production, shall be reported to the nearest Texas Department of Water Resources District Office (see Appendix A,1). The Texas Department of Water Resources District Office will report all such spills to the Texas Department of Water Resources Central Office in Austin on a completed spill report (form TDWR-0002, Appendix D) by mail.
- c. The Texas Railroad Commission and the Texas Department of Water Resources, depending on which agency has primary responsibility, will inform other concerned State and federal agencies as appropriate. However, this will not absolve or excuse the party responsible for any spill or discharge from complying with applicable federal regulations including reporting directly to the National Response Center (800/424-8802 or 202/476-2675).

(2) Medium and Major Oil Spills (see .004 Definitions, page 2)

- a. Spills of crude oil or liquid hydrocarbons closely associated with production of oil or gas shall be immediately reported to the nearest Texas Railroad Commission District Office.
- b. Spills of all other types of oil, i.e., not closely associated with production, shall be immediately reported to the Texas Department of Water Resources Central Office in Austin, Texas.

- c. The Texas Railroad Commission and the Texas Department of Water Resources, depending on which agency has primary jurisdiction, will make immediate telephone contact with the Office of the Governor and all other concerned State of Texas agencies; the Environmental Protection Agency, Region VI; and/or the appropriate U.S. Coast Guard Captain of the Port.

(b) Containment and Oil Removal

- (1) Responsibility—the party responsible for the activity or facility from which an oil spill occurs is responsible for the containment or cleanup of the spilled oil. In the case of a barge in the process of being moved by a tug, the operator of the tug is responsible for containment of any spilled oil. Removal or cleanup of the spilled oil is the responsibility of the registered owner of the barge and/or the owner of the oil being transported.

Where the origin of an oil spill is known, the responsible industry or source shall be officially contacted by the State of Texas agency in charge, either the Texas Department of Water Resources or Railroad Commission of Texas, and will be requested to initiate a maximum response toward oil pollution containment and removal. Assumption of responsibility by an insurance carrier will not be allowed to defer or impede removal of the pollutant.

Where the origin of an oil spill is unknown, containment and removal of the spilled oil is the responsibility of whoever is designated to undertake these tasks by either the U.S. Environmental Protection Agency or the U.S. Coast Guard. In the event neither of those agencies act to authorize oil removal operations, the State of Texas, through the Texas Department of Water Resources as designated by the Governor of Texas and as authorized in 1972 by the Federal Water Pollution Control Act as amended and further, as provided in the National Oil and Hazardous Substances Pollution Contingency Plan, may authorize oil removal operations. In such cases the Texas Department of Water Resources is also designated as the State of Texas agency to request reimbursement through the Environmental Protection Agency and/or the U.S. Coast Guard for reasonable costs incurred in state-authorized and supervised oil removal operations. Reimbursement, if approved by the U.S. Coast Guard, would come from the revolving fund administered by that Agency.

- (2) Containment—the initial thrust of cleanup action will be to halt the spread of spilled oil by floating booms or other similar devices.
- (3) Oil Removal—simultaneously with placement of containment devices, oil removal operations should be initiated using methods and/or equipment capable of removing the oil from the water and transferring it to a container for transport to a disposal site. Oil removal, cleanup and disposal activities by the responsible industry or other source shall be to the satisfaction of the Texas Department of Water Resources and/or a Railroad Commission of Texas representative depending on which agency

has jurisdiction. The concerned District Office shall seek the advice of the Central Office on a suitable disposal site. If disposal in a sanitary landfill appears to be a desirable alternative, the appropriate Regional Office of the Texas Department of Health will be involved in the approval process.

- (4) **Chemical and Other Treating Agents for Oil Spill Cleanup**—treatment of oil or hazardous substance/waste spills with chemicals and other additives must be in accordance with the National Oil and Hazardous Substances Pollution Contingency Plan. Annex X of the plan sets forth a schedule for acceptance and approval of materials applied to oil or floating hazardous substances/wastes to mitigate the effects of a spill or discharge. The plan requires, prior to use of chemical or biological additives,
 - 1) Submission of technical product data to the Environmental Protection Agency (EPA) for acceptance,
 - 2) acceptance approval by the EPA,
 - 3) approval by the EPA representative to the Regional Response Team and,
 - 4) approval from the State and local public health and pollution control officials. The Department will serve as the primary contact for coordination of any effort to obtain approval of State health and pollution control officials including the Texas Parks and Wildlife Department and Texas Department of Health.

The On-Scene Coordinator (OSC) will have the final decision for or against approval to use an accepted material in a given situation. He will be guided by the EPA, the State and criteria set forth in the National Contingency Plan. Dispersants and/or sinking agents may not be used at any point without approval of the Texas Department of Water Resources or Texas Parks and Wildlife Department representatives on the scene.

- (5) **Equipment and Manpower**—the major source of equipment and manpower in the area affected by an oil spill is industry. Industry is prepared, and is continuing to improve its capability, to initiate cleanup action on any spill of oil or other hazardous substance/waste. In the case of a minor oil spill, if deemed necessary by the responsible party, the nearest industry cooperative office (listed in Appendix B,1) should be notified as early as practical. In the case of medium and major oil spills, the nearest industry cooperative should be notified as soon as possible.
- (6) **Communications**—insofar as possible, appropriate persons, other than State or federal agencies, should be notified of the occurrence of an oil spill and its direction of movement so that individual protective efforts can be initiated by persons who might later be affected by spreading oil.

During and following the control of and removal of spilled oil the Texas Department of Water Resources and/or Railroad Commission of Texas will be responsible for keeping all concerned State agencies and others

fully informed of the progress of the cleanup operations. The Texas Department of Public Safety, Division of Disaster Emergency Services ^{MANAGEMENT} may serve as a communications point to disseminate information for these two agencies.

A final report on each major oil spill will be made by the Texas Department of Water Resources to the Office of the Governor of Texas, the Legislative Budget Board, and the State Auditor following approval by the Department of Water Resources pursuant to the Texas Spill Prevention and Control Act.

- (7) **Prevention of Oil Spills**—All operations in the State of Texas involving oil and gas exploration, production, transportation, and storage shall be in accordance with applicable rules and regulations of the Texas Railroad Commission and/or the Texas General Land Office. Additionally, storage of produced crude oil or gas in the State of Texas shall be pursuant to Texas Air Control Board Regulation V, Control of Air Pollution from Volatile Carbon Compounds. (Federal regulations concerning oil pollution prevention were published in December 1973.)

The storage of materials derived from petroleum, but not crude oil or gas closely associated with the production of crude oil or gas, as well as the storage of any other hazardous substance/waste, shall be pursuant to specifications, rules and regulations of the Texas Department of Water Resources where such specifications, rules, or regulations have been published and pursuant to Texas Air Control Board Regulation V, Control of Air Pollution from Volatile Carbon Compounds.

.008 **Hazardous Substances, Hazardous Wastes, and Other Substances or Pollutants, Spills** (See also page J.1)

(a) **Discovery and Notification**

Spills and/or accidental discharges of hazardous substances/wastes, upon discovery, shall be immediately reported to the Texas Department of Water Resources. Other substances or pollutants spilled or accidentally discharged shall be reported by telephone as soon as possible and not later than 24 hours as follows:

- (1) Upon discovery of any amount of spilled or accidentally discharged hazardous substance/waste or other substance or pollutant, a telephone report shall be made to the Texas Department of Water Resources District Office responsible for the county in which the spill occurred (see Appendix A.1). Telephone reports shall contain as much of the information listed (see .006 Telephone Reports) as possible. In the event it is not possible to contact the Texas Department of Water Resources District Office, a report shall be made by telephone to the Texas Department of Water Resources Central Office in Austin, Texas. (see .006 page 4)
- (2) Upon receipt of telephone notification by the Texas Department of Water Resources District Office, if in the judgment of that office the spill or

accidental discharge will have a major impact of any kind, the concerned District Office will make an immediate telephone report to the Texas Department of Water Resources Central Office. In addition, if it appears that the spill may cause a public or environmental health hazard, the concerned District Office will make an immediate telephone report to its counterpart in the Texas Department of Health. The Texas Department of Health will provide technical assistance and recommendations to the Texas Department of Water Resources and local health authorities to minimize or alleviate any health hazards that are determined to exist. Otherwise, in the case of spills of minor significance, the District Office will submit a routine spill report (form TDWR-006, Appendix D) by mail.

- (3) Upon notification of a significant spill or accidental discharge of a hazardous substance/waste, the Texas Department of Water Resources Central Office will immediately initiate notification of other concerned State and federal agencies (see .006 Telephone Reports, page 4). As previously stated, this will not absolve or excuse the party responsible for any spill or discharge from complying with applicable federal regulations concerning spills of hazardous substances/wastes, or from the responsibility of reporting such spills or discharges directly to the National Response Center (800/424-8802 or 202/476-2675).

(b) Containment, Removal and/or Treatment

(1) Hazardous Substances/Wastes

- a. The party or entity responsible for the activity, facility, or vehicle from which a spill of a hazardous substance/waste occurs is responsible for containment, treatment and/or removal and disposal of the hazardous substance/waste. The concerned Texas Department of Water Resources District Office will seek the advice of the Texas Department of Water Resources central office concerning disposal of the hazardous substance/waste. If disposal in a sanitary landfill appears to be a feasible alternative, the spiller will be directed by the concerned Texas Department of Water Resources District Office to contact the Texas Department of Health through the appropriate Regional Office for approval of the disposition scheme.
- b. The responsible party shall take immediate action to contain, remove, or nullify the effects of the pollutant substance.
- c. Useful information regarding chemicals and methods by which spilled substances can be handled is available from the Chemical Transportation Emergency Center, telephone number 800/424-9300. It is the responsibility of the spiller to obtain such information and, where possible, to put the information to use as soon as possible but only after consultation with a representative of the Texas Department of Water Resources.

(2) Radioactive Materials

In the event of a spill or accidental discharge of any radioactive materials, the individual operating, in charge of, or responsible for the activity or facility from which the spill or accidental discharge occurs shall notify the Texas Department of Health in accordance with the procedures and requirements established by the Department (see .006, page 4 and Appendix E).

(c) Written Reports

Within 15 days after an incident involving the actual or potential release of a hazardous substance/waste from a storage, processing or disposal facility, the responsible owner or operator must submit a written report on the incident to the Department as indicated in Department Rule 156.22.10.007 concerning industrial solid waste management emergency procedures.

(d) Prevention of Spills of Hazardous Substances/Wastes

Every effort must be made by the party responsible for the storage, handling, or transportation of hazardous substances/wastes to provide for spill prevention, containment of accidental spills and a countermeasure plan to be used in the event of an accidental spill or discharge. Failure to provide for such a plan may, upon consideration of the circumstances under which a spill or accidental discharge occurs, be deemed as negligence and be the basis for appropriate legal action pursuant to the provisions of the Texas Water Code. Suggested guidelines for a Spill Prevention, Containment, and Countermeasure Plan are attached as Appendix C.

.009 Contingency Plan Modifications

The State of Texas Oil and Hazardous Substances Pollution Contingency Plan is deliberately intended not to include all that is known about the availability of materials, supplies, or equipment to be used in pollution containment or removal operations. Such details are already listed in the pollution contingency plans of the Environmental Protection Agency (Region VI) and the United States Eight Coast Guard District. However, it is anticipated that the State of Texas plan will be revised and supplemented with emergency response procedures.

.010 Legal Action

Nothing in this contingency plan precludes the State of Texas, any subdivision thereof, or any person or other entity from initiating legal action for injunctions, fines, or damages.